THE WHITELANDS SERIES

OF

STANDARD READING BOOKS

FOR GIRLS

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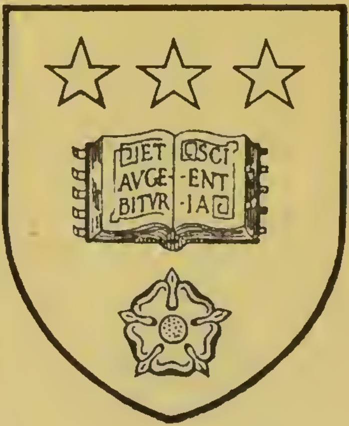

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THE WHITELANDS SERIES

OF

STANDARD READING BOOKS

FOR GIRLS.

EDITED BY

REV. J. P. FAUNTHORPE, M.A.,

PRINCIPAL OF THE WHITELANDS TRAINING COLLEGE.

STANDARD V.

DEDICATED, BY PERMISSION, TO

HIS GRACE THE DUKE OF WESTMINSTER, K.G.

FOURTH EDITION.

DOMESTIC ECONOMY

AND

HOUSEHOLD SCIENCE

LONDON:
EDWARD STANFORD, 55, CHARING CROSS, S.W.

1881.

DEDICATION.

TO HIS GRACE

THE DUKE OF WESTMINSTER, K.G.,

President of the Manchester Domestic Economy Congress, 1878, *&c.*

My Lord Duke,

The efforts of your Grace for the amelioration of our labouring and artisan population are known throughout the land.

By your warm encouragement and liberal support of all endeavours to promote education, industry, and thrift, providence and honourable self-help, among the working classes, your Grace has rendered a valuable service to the whole community; established for yourself a lasting claim to the gratitude and esteem of all who appreciate wisely-directed philanthropy; and vindicated your right to that proud title, a leader of men.

That this little work may, by disseminating sound and practical information on Domestic Economy and Household Science, aid in promoting those objects, in which your Grace has manifested so deep an interest, has been the aim of,

My Lord Duke,

Your Grace's faithful servant,

THE EDITOR.

S.14481

PREFACE.

THE whole of this Standard has been specially written. It is divided into parts according to the former divisions in the Code, but as each Lesson is separate, the Lessons may be taken in any order that suits teachers best.

The Introductory Lessons may be omitted or not, according to the wish of the mistress and the capacities of the children. But, on the whole, it would be wise to master these first, as then much subsequent explanation would be rendered unnecessary. The book, it is hoped, is a connected whole, although the Lessons are complete in themselves.

Domestic Economy is most important, and it is desirable that all schoolmistresses should make a vigorous and continuous effort to teach it, and that not as an *extra subject* merely.

The words at the head of each chapter ought to be thoroughly mastered, with or without the derivations, as the mistress shall think best. If with, then other cognate words should be mentioned. Teachers will find that words are easily and pleasantly learnt in this manner.

In the Pronunciation Exercises the whole list of words drawn up by the great master of English dialectic pronunciation, A. J. Ellis, Esq., F.R.S., have been, with his permission, used.

Any corrections, or suggestions for the improvement of this Standard will be thankfully received by the Publisher.

PREFACE TO SECOND EDITION.

THAT a whole impression of this little book has been sold in half a year is some proof of its excellence, so vigorously advocated in the 'Saturday Review' of June 7, 1879.

A few alterations, additions, and corrections have been made in this edition, and the book is now stereotyped.

It may be worth while to state that the Introductory Lessons in Domestic Economy, which form the first section of Standard VI., were originally intended for this, and could they have been inserted would have stood thus:—

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(*Code*, *p.* 28, 1877.)

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§ 2. Clothing and Materials.

(*Code* 1879, *p.* 31.)

DOMESTIC ECONOMY.

	First Branch.	Second Branch.
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,, II.	The Dwelling: Warming, Cleaning, and Ventilation.	Food: its Functions.
,, III.	Rules for Health: the Management of a Sick Room. Cottage Income, Expenditure, and Savings.	Food: its Preparation and Culinary Treatment.

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A

STANDARD V.

DOMESTIC ECONOMY

AND

HOUSEHOLD SCIENCE FOR GIRLS.

INTRODUCTION.—EXPLANATORY LESSONS.

LESSON I.

THE MEANING AND USES OF DOMESTIC ECONOMY

DERIVATIONS.

Education.—Bringing up, training, formation of manners. *Lat.* **ēdŭcātio.**

Derived.—Drawn from. *Lat.* **dērīvo,** to draw off.

Ignorant.—Unlearned, knowing nothing. *Lat.* **ignōrans,** not knowing.

Ancient.—Not modern. *Fr.* **ancien,** past, former.

Classical.—Of the first rank; ancient. *Lat.* **classĭcus.**

Materials.—Substances of which anything is made. *Lat.* **mātĕrĭa,** the mother stuff; māter = mother.

Ventilation.—The constant removal of bad, and the supply of good, air. *Lat.* **ventĭlātio**; ventus = wind.

N.B.—Teachers should see that their pupils master these words before beginning the lesson. If further explanation be needed, let the words be placed in a simple sentence.

PRONUNCIATION. Exercise on *A*, as in
ass, ask, ashes, wash, last, &c.

VERY nearly, if not quite all, the knowledge of the world, is stored up in words. They are the warehouses, or storehouses of meaning; and a very large, and very necessary part of all right education consists in teaching the meaning of words.

In our English language, which is very beautiful and rich, and a well-sounding language, too, if it be properly pronounced, there are many words which come to us from other tongues, from the Latin of the ancient Romans, for example; from Greek. as well as from nearly every modern language, especially French. Such words are said to be *derived* from Latin &c. The Latin word is called the *root*, because numbers of other words have sprung from that one, just as many branches spring from one root of a tree. It should be the duty of everybody who reads a book, to understand the words in which it is written. Unless readers do this, they are sure to misunderstand the meaning in some way. In talking, no word, the meaning of which is not known, should be used. Some ignorant people, use long, difficult words, thinking it fine, or grand, or learned.

There is a very old fable of an ass in a lion's skin. Seeing him, some workpeople made off as fast as they could, and to increase their speed the ass began to bray. The men immediately returned, laughing at their mistake, but angry with the donkey for trying to appear what he was not; and they gave him a sound beating, which he richly deserved.

You may read about a man who put on a lion's skin in Shakspere's 'Midsummer Night's Dream.' He honestly told the people that he was not a lion, although he had on a lion's *fell*, i.e. skin. "Then know," he said, "that I, one Snug, the joiner, am."

The words at the heads of the lessons in this book should be thoroughly well learned, then you may hope to understand and benefit by what is here written for your profit.

The word **domestic** is almost pure Latin, the language spoken by the grand people of Rome, who subdued a great part of Europe, as well as some districts of Asia and Africa. They have left marks of their greatness behind them in nearly every country, in castles, roads, and above all, perhaps, in laws. Thus in England every name of a town ending in *caster*, or *chester*, was once a Roman encampment; every one ending in *coln* was a Roman colony.

The Latin word *dŏmestĭcus* is an adjective, and means, belonging to the house. Everything pertaining to the house, a household, or family, was included in this word. So we speak now of domestic affairs. Servants are called domestics. Animals, such as horses, cows, pigs, cats, dogs, &c., that live in or near the house, are said to be domesticated.

The term *economy* is a Greek word. The Greeks were in some things a grander people than the Romans. Both Latin and Greek are said to be dead languages, because they are not spoken now by any people. The present inhabitants of Greece speak Hellenic, or modern Greek, which differs a good deal from the ancient or classical Greek. The people who live in Rome and Italy speak Italian, which differs as much from classical Latin, as Hellenic does from classical Greek; or modern English from Anglo-Saxon or Early English. The Greek word from which Economy is derived is **oikonomia**, which means, the proper management of household affairs. It supposes that everything is done in a house according to fixed law, or rule, and not anyhow. It includes order, and good method, in doing things, and the right time for doing them.

You see, then, that Domestic and Economy mean very nearly the same, the first in Latin, the second in Greek. By economy some people mean carefulness in spending money, but it comprises very much more than that, as we shall see by the time we finish this book.

Domestic Economy, as the subject is now called, includes accurate knowledge about a house and everything relating to its management; and proper use of that knowledge. To know right is well, but to do right is better. Wisdom is the right use of knowledge. A wise girl therefore is one who uses well what she knows for her own good, and that of others. Domestic economy includes a knowledge of food and how to prepare or cook it well; a knowledge of the most suitable materials for clothing, and how to make them up best; a knowledge of the warming, cleaning, and ventilation of the house in the best and cheapest ways; a knowledge of the proper materials for washing, and how to use them; a knowledge of the rules of health and living according to them, as well as the proper management of the sick-room when any one is ill; and lastly, it includes a knowledge of money, how to earn, how to spend, how to save it; with the best manner of accomplishing these objects, and what is of still more importance, of doing them truly and honestly.

This is the science of Domestic Economy; and every English girl ought to know it well, for upon girls and women depend almost entirely the domestic happiness of men, and the economical management of their earnings.

At least one or two good results, if not more, ought to spring out of this knowledge. The first is, that when people know what to do they will do it, honestly, earnestly, bravely, and well. A wrong thing is not to be done on any account, either because it is common, or because somebody (or even everybody) else does it;

but **the right thing is to be done because it is right.**

Another result we hope for is, that when girls are rightly instructed in the elements of domestic economy, and understand them, waste will cease. There is shameful waste at present in nearly every house where much management has to be left to domestic servants; and this is especially the case where there are careless housekeepers and what are called upper servants.

All Waste is Sinful. It is abominable ingratitude to God. It is heartless robbery of the poor. It is base and knavish dishonesty to the master and mistress. It is worse than downright *picking and stealing* or vulgar thieving, because they can be punished by the policeman, the lock-up, and the house of correction; whereas waste cannot.

We want girls then to do what is right; to be honest; and never to waste anything.

LESSON II.

AIR. VENTILATION. OXYGEN.

DERIVATIONS.

Air.—*Lat.* and *Gr.* **āër**, the lower atmosphere. *Distinguish* **aether**, the upper.

Oxygen.—*Gr.* **oxus**, an acid; **gennao**, I give rise to.

Ventilation.—Supplying fresh and removing impure air. *Lat.* **ventilatio**; **ventus**, wind.

Atmosphere.—Air that encompasses the earth. *Gr.* **atmōs**, air; **sphaira**, globe.

Vapour (*Lat.* **văpor**).—Exhalation; anything that mingles with air.

Vegetation.—All plant life. *Lat.* **vĕgĕto**, to arouse, enliven.

Saturated.—Filled till no more can be imbibed. *Lat.* **sătŭro**, to fill, glut.

Electrical.—That kind of attraction developed originally by rubbing amber = *Gr.* **electron.**

Patent.—Open, well known. *Lat.* **pătĕo**, to be open.

Indigestion or **Dyspepsia.**—A disease under which the process by which food is fitted for bodily nourishment is not carried on. *Lat.* **dīgestĭo**, division, distribution.

Combustion.—Burning. *Lat.* **combustio.**

PRONUNCIATION. Exercise on *A* in
hand, land, wander, candle, want, came, lamb.

NEITHER plants nor animals could live without air This air which surrounds us on all sides, and is inside as well as outside our bodies, is a mixture of two gases, called respectively oxygen and nitrogen. About four gallons out of every five of atmospheric air consist of nitrogen, and the one gallon of oxygen. More accurately, there are in every 100 parts of air, 20·9 parts of oxygen, and 79·1 parts of nitrogen, by volume or bulk. If the 100 parts were weighed we should find the oxygen weigh 23·1 parts, and the nitrogen 76·9 parts i.e. ounces or pounds. Air also contains a large quantity of vapour, mostly in an invisible state, but sometimes visible enough as *fog* or cloud. This vapour is always going off into the air from vegetation, from the earth's surface, and especially from water. When air will hold no more it is said to be saturated, and moisture then begins to come out, as rain, or snow, or hail, according to the temperature or electrical condition of the atmosphere. Its electrical condition determines whether lightning and thunder are frequent or rare.

The warmer the air the greater the quantity of vapour it will hold. If you watch the steam from a locomotive engine on a hot, dry day in summer, or on a damp, muggy day in winter, you will see a good illustration of this. Diminution of temperature acts upon the vapour in the air, very much in the same way as a squeeze of the hand to a sponge full of water.

The air contains, besides vapour, small quantities of carbonic acid gas, of ammonia or hartshorn, and of a little-known substance called ozone, which is said to be oxygen in a different state. Air with abundance of ozone is considered healthy. The injurious effects are more evident from the absence or diminution in quantity of ozone, than the good results are from its presence, as it is natural to expect.

It is not known how far up the atmosphere extends; but it is generally supposed to reach a height of between forty-five and fifty miles. If one were to walk three miles an hour it would take sixteen hours to walk forty-eight miles. The loftiest mountains on the earth are not more than five miles high; so air extends forty miles beyond their tops. This atmosphere exerts upon the earth a very considerable pressure. Air can be weighed. It is known that the pressure of a column of air from the very highest to the sea level, on a square inch of surface, is about 15 lb. avoirdupois. The pressure of the air, therefore, on a human body must be many tons. A ton is 2240 lb. So that the air exercises a pressure of nearly one ton, which is usually as much as a horse can draw in a cart, on about 150 square inches, or rather more than a square foot. This is less than the area of a healthy adult's chest. This pressure, more than enough to crush us to death, is counteracted by the elasticity of the air inside our bodies. Very much use is made of the property of the atmosphere to press equally in all directions. When pressure is removed from the top water will rise in a tube. This is what happens in a pump. If you take a glass tube, place it in a basin of water, and draw out the air, you will see some of the water rise quickly up. If you place your tongue or finger at the top of the tube very close and lift it out of the water, you will find that the water will remain in the tube, being kept there by the upward pressure of the air on the lower end.

If you fill a tumbler with water and place a sheet of paper carefully over the top quite close, and then turn it upside down cleverly, the water will not run out; because the air below presses up, and all the air at the top of the water was removed by the paper.

There are a great many other interesting things that might be told you about air, but perhaps the most interesting to you is that you want it, and cannot live without it.

The supply of sweet, fresh air to houses, schools, &c., is generally spoken of under the name **ventilation,** which means, giving fresh air to anything and removing the bad. The Latin for air or wind is *ventus.* The verb is *ventilate.* Apertures or holes through which air is admitted into rooms are provided in what are called *ventilators*, some of which are *patent*, because they were invented by one man, and belong exclusively to him for a number of years, his right being secured by *letters patent*, as the legal forms are called. Expensive ventilators are not necessary, except perhaps in large buildings; and patent ventilators are mostly useless, because, for some reason or other, they do not act well. Every house is provided with windows, and if the windows will open at *top and bottom* they form the handiest and the best ventilators. Remember, the window must be open at top and bottom—at top, that the foul or overheated air may go out—at bottom, that the sweet, pure, cool air may come in. If many people sit in a room which is not regularly ventilated, they slowly poison themselves. Some people are terribly afraid of draughts, and would much rather be poisoned slowly than feel the breath of fresh air. This is grossly unwise, not to say foolish, and leads to many diseases. All transgressions of rules of health are sins against the body, and never escape punishment. Draughts do not hurt people in good health. Still, no one, when warm from exercise, should sit in a draught, which generally leads straight from the window to the fire-place, or from one door to another. There are plenty of free places in a room. Draught in, and not through, can never hurt any one whose body is at a proper temperature.

It is well to sleep with windows a very little open. Beds should never be made on the floor, because the heavy, poisonous air, carbonic acid, sinks to the lowest part of the room. A bedroom should never be quitted without throwing the window well open. The upper sash should be pulled down, and the lower thrown up. Sitting-rooms, especially if gas be burnt, should be frequently ventilated. The chimney should never, on any account, be closed in summer. Some people are so unwise as to close it with a bag of straw or shavings. They also carefully place list round the door, so that no particle of fresh air can get into the room. It is no wonder they look pale, have headache, indigestion, and other complaints. What would happen to them if they kept wholesome food and wholesome drink as carefully away from their bodies, as they keep wholesome air—which is quite as necessary as food or drink?

The best way to ventilate large rooms is to have properly arranged ventilators in the roof, which *cannot be closed.* There are various contrivances for admitting fresh air, such as perforated bricks, or perforated metal, in the walls or floor, and perforated glass in the windows. Let one thing be remembered. **Fresh, pure air is absolutely necessary to healthy life.**

Note from 'Daily News,' May 30, 1878.

"Two men, named Hudson and Chapman, who were engaged yesterday in sinking a well near Guildford, were killed by the foul air. Two men who descended the well to rescue them were also killed, and a third man who went down was pulled up just in time to save his life."

Oxygen.

Oxygen is a gas, an invisible, inodorous, transparent gas. It has, however, quite recently been liquefied by a French chemist. It is also an element, and one of the most important of all; as will readily be understood from the fact, that about half the weight of the round world and its forty-five miles wrapping of air, consists of oxygen; not, of course, of oxygen as a gas, but of oxygen in combination with other substances or gases. It combines very readily with nearly all other substances.

Its name means "*I give rise to, or cause acid.*" It causes sourness. The gas was discovered about a hundred years ago (1775) by Dr. Priestley, in England; and almost simultaneously by Lavoisier in France. The name *vital air* was given it at first, but it is now universally known as oxygen. Because it unites so readily with many other elements it has been named *Busybody Oxygen.* An interesting little book so called may be bought for twopence, of the Ladies' Sanitary Association, Berners Street, Oxford Street, London.[1]

Oxygen forms about one-fifth of the air by bulk. You can prove this. If you place a small piece of candle on a cork, so that it will float easily in a pan of water, light the candle, and then cover it with a transparent glass jar—a pickle jar will do very well—you will find that the candle will soon begin to burn very dimly and will then go out. As soon as this happens you will see the water rise up in the jar until it fills the space which the oxygen formerly did, i. e. about one-fifth. You have proved something else by this experiment. You have proved that **oxygen supports combustion**; but it does not burn. Fires would be impossible without oxygen. But oxygen requires to be diluted with four times its bulk of nitrogen, or else everything would be burnt up. **Oxygen also supports life,** but better when diluted with nitrogen as in air. If we breathed pure oxygen, we should be soon in a dreadful fever, and die. When oxygen combines with iron it rusts. When oxygen combines with the elements in coal or tallow they burn. Oxygen exists in nearly all animal and vegetable substances, and forms the greatest part by weight of water.

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[1] See also 'Simple Lessons.' E. Stanford.

Many beautiful experiments can be performed with oxygen which cannot be described here. You can read about them in books on chemistry. If you ever get an opportunity of seeing them, you are sure to be delighted.

LESSON III.

NITROGEN, HYDROGEN, CARBON, AND CARBONIC ACID.

DERIVATIONS.

Nitrogen, nitrogenous.	—**Nitrogen** means the generator or former of nitre.
Hydrogen.	—*Gr.* **hudōr**, water; **gennao**, I give rise to or cause.
Carbon, carbonaceous.	—*Lat.* **carbo**, a piece of charred wood.
Acid.	—Anything sour, sharp. *Lat.* **ăcĭdus**, sour, tart, biting.
Adulteration.	—Mixing good with bad. *Lat.* **adulteratio.**
Nature.	—The regular course of things. *Lat.* **natura.**
Characteristic.	—Special mark or stamp. *Lat.* and *Gr.* **character**, a marker.
Constituent.	—That which is necessary to a thing. *Lat.* **con** and **sto**, to stand firm.
Crystallized.	—Turned into crystals. *Gr.* **krustallos.**
Property.	—A special quality. *Lat.* **proprius**, one's own, special.
Essential.	—That without which a thing cannot be what it is. *Lat.* **essentia**, the being of a thing (cf. *essences*).

PRONUNCIATION. Exercise on *O*, as in

tongs, won, wound (*v.*), from, comb, load.

Nitrogen.

Nitrogen, like oxygen, is colourless, transparent, inodorous. It is also a gas and an element, and was called at first *azote*, because it does not support life.

It forms no less than four-fifths of the air or atmosphere, as you proved when you burnt the bit of candle floating on water with a bottle placed over it. When the oxygen was used up, the candle went out, and the water filled about $\frac{1}{5}$th of the bottle, the remaining $\frac{4}{5}$ths being nitrogen.

Adulteration as a rule is wicked, but if the oxygen of the air were not adulterated with nitrogen, we should all die, and everything would be burnt up. So you see that nitrogen is very important to us, although it supports neither life nor combustion. A light placed in nitrogen immediately goes out. An animal put into it would die at once.

It exists very largely in nature, but not so largely as oxygen. It is found combined with other elements in several animal and vegetable substances. These form when eaten what is called **nitrogenous food,** one of the great divisions of food substances, which is required as a flesh-former.

Nitrogen forms a large part of the salt called **saltpetre,** or **nitre,** which is very extensively used to make gunpowder, and also to a small extent in curing bacon.

Nitrogen is not so heavy as oxygen, but it is heavier than hydrogen, the next gas we are to speak of. If a certain bulk of hydrogen weighed one ounce, the same bulk of nitrogen would weigh 14 ounces; so you see that nitrogen is fourteen times as heavy as hydrogen.

Hydrogen.

Hydrogen, like oxygen and nitrogen, is also a colourless, transparent, inodorous gas. It is the lightest of all the elements. This is something special about it, which must be carefully remembered; just as the case with which oxygen combines with other elements must be remembered about that gas; and the slothful or sluggish character of nitrogen about it. Each gas has a peculiar characteristic; just as every girl has her own special features and character.

Hydrogen enters largely into the composition of water, which consists of oxygen and hydrogen chemically combined. Think how wonderful that is. Two colourless, transparent gases, when combined, make the liquid water, without which there could be neither animal nor vegetable life. What is perhaps more strange is, that the union takes place by burning, or by electricity, and that a loud report is heard at the instant when the union occurs. You remember oxygen does not burn, but it supports combustion. Now hydrogen does not support combustion, but it burns with a thin, almost invisible blue flame. The flame gives hardly any light, but is intensely hot.

The gas burnt in houses and street lamps and sometimes in railway carriages, consists in great part of hydrogen. But it derives its light-giving property from carbon and some other substances mixed with it. When it is burnt the hydrogen in it unites with the oxygen of the air and forms water, so that a large quantity of water is formed in any room where gas is burnt. You will remember then that it is no use to light the gas in order to dry a room permanently. This water generally spoils brass, or bronze, or gilt of any kind, and especially the gilt on books.

The gas burnt in houses is, as you perhaps know, obtained from distilling coal in closed tubes. If you fasten a small piece of bright coal in a pipe with a long shank, the bowl of which you have first closed up with a bit of clay, and then place the bowl in a hot fire, you will soon see a light smoke come out. If you apply a light, you will find that it will burn

The light smoke is gas. This shows that hydrogen exists in large quantities, together with carbon, sulphur, and other substances, in the coal we burn. It is also a *constituent* part of most animal and vegetable substances.

Perhaps you have seen a balloon go up. Very large balloons are filled with gas from the meter, because it is the lightest gas obtainable in very large quantities. It would be better to fill them with pure hydrogen, but it is so difficult to obtain it in very large quantities, that coal gas is used instead. In small balloons hydrogen is generally used.

Carbon.

The three elements oxygen, nitrogen, and hydrogen, at ordinary temperatures are gases; but *carbon* is a solid. The commonest form in which carbon occurs tolerably pure is black charcoal, made from burnt wood. Coal and coke consist in great part of carbon, coke more especially.

The blacklead which is used to make lead pencils for writing and drawing, is a very pure kind of carbon. Its proper name is *plumbago* or *graphite*. It is found at Borrowdale in Cumberland in small quantities, and is imported from Siberia, Ceylon, Singapore, and other places. The best pencils are made of thin slips cut from native lumps, but common ones are made from the powder pressed together. The powder is also used, as you know well enough, to black grates and stoves. The most beautiful form of carbon is the *diamond*, which is crystallized carbon, and is the hardest substance known. It is used to cut glass, as well as for other purposes, as in watches, &c., besides its great use as an ornament in jewellery.

Carbon exists in combination with other elements in all animal and vegetable substances. If any animal or vegetable substance were exposed to great heat in a vessel, the gaseous parts would be driven off, and the portion that would remain would be black, and would consist almost entirely of carbon. If the bread be burnt, or the meat overdone in roasting, you have all seen carbon, in that form.

If you were to hold a spoon or knife over a candle burning, the spoon would be covered almost immediately with a layer of black soot. This is almost pure carbon. It is the carbon at a white heat which gives light, and, as you will have found, a good deal escapes unburnt into the air from candles. Various lamps have been constructed to burn oils of different kinds, so that as nearly as possible all the carbon which they contain shall be burnt. In this case we have a very brilliant white light. Lampblack, which perhaps you have heard of as the chief ingredient in black colours, is obtained from partly burning resin, or coarse turpentine.

Charcoal is very useful in purifying other substances, because it has a strong affinity, or a liking for many of the gases produced by decomposition. You know that charcoal made from wood is very light, because it is so full of pores. These pores readily absorb gases. Thus if meat be tainted, or be high, as it is said, and before being cooked be placed in charcoal, all the bad smell will be removed. If bones be burnt to charcoal and then be mixed with water that is not quite pure, all the impurities, or nearly all, will be removed. Dirty water, or water that emits a strong odour of any kind, can mostly be purified by animal charcoal. It is a good plan to have a wire pan full of charcoal in the water-closet. Many other substances consist mainly of carbon, besides those we have mentioned. Thus, bitumen, naphtha, tar, tallow, wax, paraffin, and all other oils, whether mineral or vegetable, are forms of carbon.

Carbonic Acid Gas.

Carbon is a solid, but carbonic acid is a gas. If solid carbon be burnt in plenty of air, and still more if in oxygen, carbonic acid is formed. So you see carbonic acid consists of two elements, carbon and oxygen. In a given quantity, 12 parts by weight would be carbon, and 32 oxygen. It is therefore a compound body, and not a simple element. It has some very remarkable properties, and plays an important part in the economy of our bodies, so you must try to understand and remember very carefully a few facts about it.

Carbonic acid is an invisible, inodorous, transparent gas, resembling in these respects oxygen, hydrogen, and nitrogen. But it differs from them in many essential particulars. It is twenty-two times as heavy as hydrogen. It is heavier than atmospheric air, and can be poured out of one vessel into another just like water, and although it cannot be seen descending, yet if a lighted candle be placed at the bottom of the vessel into which it is poured, the light will at once go out. This shows that carbonic acid does not support combustion. In this it resembles nitrogen.

Carbonic acid can be obtained from marble, which consists of this acid and lime.

The acid unites very readily with lime, and this you can easily prove. If you take a tumbler of lime-water, and breathe into it through a glass tube, you will find that the water soon becomes like milk. This is caused by the union of the carbonic acid from your breath with the lime dissolved in the water, which becomes visible as a white powder, and if left would in time settle at the bottom.

It is possible to turn the gas carbonic acid into a liquid, but this can be done only under immense pressure, viz. of thirty-six atmospheres, i. e. thirty-six times 15 pounds on every square inch. This is difficult for you to understand, but it cannot be expressed in easier terms.

As carbonic acid is a heavy gas, it always sinks to the lowest part of a room or an enclosed space. For this reason then, remember that a bed should never be made on the floor.

There are some pits containing much carbonic acid that would kill a dog, but a man would be quite safe in them whilst standing, because his mouth would be above the gas. It is to be remembered that **carbonic acid** is **poison to men** and animals, but **food to plants,** which take it in during the day time.

LESSON IV.

WATER.

DERIVATIONS.

Elements.—Simple substances. *Lat.* **ĕlĕmenta**, first principles, elements.

Locomotive.—A movable engine. *Lat.* **locus**, place, and **mōtus**, motion.

Ocean.—The largest area of water. *Lat.* **ōcĕănus.**

Universe.—The whole creation; in a contracted sense, the world in which we live. *Lat.* **universum**; unus verto, turned into one.

Reservoir.—A place for storing water, *Fr.* *Lat.* **re servo**, to save, keep, preserve.

Soluble.—Capable of being taken up by some liquid. *Lat.* **sŏlūbĭlis**, that may be loosed; solvo, to loosen.

Distillation.—The process of boiling a liquid, and condensing the vapour. *Lat.* **stilla**, a drop; **stillatim**, drop by drop.

Inorganic.—Earthy or mineral matter, not organized. *Lat.* **orgănicus**, pertaining to implements.

Evaporation.—The change of water, &c., into vapour, by the action of heat. *Lat.* **e**, out, and **vapōro**, to emit steam.

Diphtheria, *Gr.*—A kind of sore throat, supposed to be caused by a minute fungus.

PRONUNCIATION. Exercise on *A*, as in

hare, tale, bathe, lane, to wane, mane (of a horse), many, lame, same.

WATER is necessary to life, whether it be of man, or animals, or plants. We could none of us live without water to drink; and water to wash ourselves, our clothes, and our houses is most necessary.

Pure water is a compound liquid, which consists of the elements oxygen and hydrogen, and contains nothing else. When oxygen and hydrogen unite as by burning, they form water. If a plate be held over a gas flame it will in time become covered with tiny drops of water, which have been formed from the burning of hydrogen, of which coal gas mostly consists, as you are aware. The water will be formed as steam, but the cold plate will condense it.

Water can exist in three states, viz. *fluid; solid*, as ice, snow, hail, hoar-frost, &c.; and *gaseous*, as vapour visible in clouds, fog, and what is called steam from a tea-kettle, or the funnel of a locomotive.

The purest water is *rain water*, at least in open country places. In towns it is very much mixed with soot and other impurities from the roofs of houses. If after a good shower of rain you look at the edge of a small pool by the street side, you will see that it is quite black with soot. Even in country places water is said to contain two grains of impurities in a gallon.

We have a very large number of rainy days in England out of the 365, and there are more in the west of England than in the east. If all the rain that falls in a year in your school-yard were collected, how much do you think there would be? There would be from a foot and a half to several feet, according to where you live. In the east of England it would be about 20 inches, round London 25, in Wales and Cumberland 60 or 70 inches. Seathwaite, in Borrowdale, is the most rainy place in the British Islands, for no less than 127 inches fall in a year. Think what 12 inches would be if none of it were to run away, or soak into the ground, or be dried up. Then, too, what an immense weight only one inch of rainfall has! One inch of rain on an acre of land would weigh about 100 tons.

If rain be collected and kept in lead pipes or cisterns it is almost sure to be poisonous.

There are two great classes of water, viz. salt and fresh. Salt water is found in all the oceans and seas, and plays an important part in the economy of the universe. When it is frozen there is no salt in the ice, and when it evaporates under a tropical sun there is no salt taken up in the vapour.

But it is with *fresh water* that domestic economy has mainly to deal. It is usual to speak of soft and hard. stagnant and running, pump or well and reservoir water, and so on. *Soft water* is rain water, and is so called because it is peculiarly pleasant to the touch in washing. It is also to be remembered that it requires the use of very much less soap, and is therefore more economical. It lathers easier, as the washerwomen say. The amount of soap that hard water will consume in washing a given number of clothes is very much greater than if the same quantity of soft water be used. And the harder the water is the more soap it will take. When water passes through the earth, it dissolves out of the earth whatever is soluble, and one of the most common substances is lime. So that water is made hard by its having dissolved some lime, and if the amount be large, you can easily detect it by means of the experiment described in Lesson III. But if the minutest quantity be present it can be detected in other ways.

Lime, salt, iron, &c., in water are called inorganic impurities. All kinds of mineral impurities can be removed from water by distillation, that is, boiling the water until it is all turned into steam, and collecting and condensing the steam again drop by drop into water. Evaporation is natural distillation. Water from streams, wells, pumps, and the reservoirs of waterworks is always somewhat hard. River water, and surface well water or land water, are sure to be loaded with impurities more or less dangerous for drinking purposes.

But there are other impurities in water more dangerous than the inorganic ones. These proceed from decaying animal or vegetable matter (as from sewage), which has found its way into it. Such impurities are called organic.

When water contains impurities of this kind it can generally be made pure and sweet by filtering it, or passing it through animal charcoal.

There should be a *filter* in every house if possible, and all water before it be used for any food purpose whatever should be filtered. Lipscombe's filters are usually recommended, and cost a guinea and upwards, according to the size. But it is quite easy to make a filter for common use thus:—Take a large flower-pot and cover the hole with a bit of sponge. Then put in some fine sand, and above this a layer of charcoal broken about as small as hazel nuts, and then above this again some more sand and a layer of fine gravel. Passing water through this will purify it. The filter will require cleaning from time to time.

You can easily find out whether water is really pure or not with a little of Condy's purple fluid. Pour a little water into a tumbler, and add a very small quantity of the fluid. If the fluid retain its own colour the water is good, but if it become brown the water is impure. See, then, that you have a filter, and do not wait until you are ill. If the doctor tell you that fever, or diphtheria, or diarrhœa is caused by the bad water you drink, it will be too late. So make one at once.

The earth is the grand filter, but some impurities exist in too minute portions to be removed by water passing through a mile or two of earth. Water has been known to carry typhoid fever from one farm to another through two or three miles of soil, even with a hill between. In ordinary circumstances shallow, or surface, wells are more or less in communication with cesspools, pigsties, privies, &c., and the water should therefore be filtered through charcoal, as it is certain to be impure.

Gaseous impurities can be driven out of water by boiling. Hard water, too, can be made less hard by boiling, as most people know. Perhaps you have seen a *furred* kettle, as it is called; and if you look at the "fur" you will see that it is a sort of stone, lining the inside of the kettle. "Fur" consists mainly of lime.

River water will sometimes purify itself if kept in an open vessel standing still, for the organic impurities in it become gaseous and escape, while the inorganic ones settle to the bottom.

Deep well waters are usually free from injurious substances, and may be used for food purposes without danger. But even they contain "30 grains per gallon of dissolved substances."

It may be interesting to know that water can be *softened* by adding more lime to it. The process is called **Clark's process,** because it was discovered by Dr. Clark of Aberdeen.

18 ounces of lime will soften 700 gallons of water. "It would require 20¼ cwt. of soap, costing about 30*l.*, or 4¾ cwt. of carbonate of soda, costing 2*l.* 17*s.* 6*d.*, to soften the same quantity of water which could be treated by Clark's process for 8*d.*, the cost of 1 cwt. of quicklime."[1] All that is necessary is to slack the lime, and when it is all fallen to powder, to mix it in a little water first, and then add more, stirring the mixture in a pail. The milky fluid should then be poured into the water that is to be softened.

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[1] 'Food,' p. 22, by A. Church. Chapman and Hall. A most useful book for teachers.

LESSON V.

CIRCULATION OF THE BLOOD.

DERIVATIONS.

Veins.—The tubes or pipes in which blood is conveyed from the body back to the heart and lungs. *Lat.* **vēna**, a vein.

Fibrin.—A fibrous substance from clotted blood, &c. *Lat.* **fibra**, fibre.

Albumen.—Nitrogenous food-substance (albuminoid substances are also called plastic, nitrogenous, and proteinaceous). *Lat.* **albūmen**, the white of an egg.

Mysterious.—Wonderful, beyond man's comprehension or understanding. *Gr.* and *Lat.* **mystērĭum**, a secret thing.

Ultimate.—Last, final. *Lat.* **ultĭmus**, the end, last.

Conical.—Shaped like a sugar-loaf, or an extinguisher, or a fir-cone. *Gr.* and *Lat.* **cōnus**, a cone.

Muscular.—Belonging to muscles; strong. *Lat.* **muscŭlus**, a muscle of the body.

Cavity.—A hollow place. *Lat.* **căvus**, hollow; **căvēa**, a cavity.

Microscope.—An instrument by which the smallest objects are magnified and made plainly visible. *Gr.* **mikros**, small, and **skopein**, to look; cf. Telescope, Gyroscope, Stethoscope.

Anticipation.—Forethought, imagination. *Lat.* **ante**, before; **căpio** (cipio), to take.

Suffocated.—Killed by deprivation of vital air. *Lat.* **suffōcātio**, a stifling; **suffōco**, to choke (literally under the fire-grate).

Asphyxiated, *Gr.*—Having the heart-beats stopped.

Anatomists.—Those who study the actual construction of bodies by examining them part by part. *Lat.* and *Gr.* **anătŏmĭa**, dissection; **tŏmus**, a cut.

Contractile.—That will contract. *Lat.* **con**, together; **traho**, to draw.

PRONUNCIATION Exercise on *O*, as in

long, throng, thong, song, strong, wrong, among.

EVERYBODY knows now that there is such a thing as the circulation of the blood. Most people have felt their own pulse, and know that it is a wave of passing blood. Nay, if people watch the veins on their hands they can see that the blood is moving in them. Most children have tried the experiment of tying up the end of one finger until it looks nearly black, and becomes too painful to endure, from the quantity of blood which is then confined in it. But before the reign of Charles I. nobody knew about this movement of the blood, and when wiser men told people of it, they would not believe.

Dr. William Harvey, who was born at Folkestone in 1578, discovered that the blood circulated, and lectured about it nine years in London before even doctors would believe it. Harvey died 1657, more than two hundred years ago.

If you were asked the question, what is blood? one way of answering would be just to prick your finger, and show a little drop. Yes, that is blood. But that does not help us much. Let us see if we can answer the question better than that. Blood appears to be a red liquid, which runs all through our bodies in veins and arteries. You could not push a pin into any part of your body, except hard, dead skin, and nails, where there would not be blood. But when blood is examined carefully it is found not to be really a red, but an almost colourless liquid, with a vast number of minute red and white globules floating in it. These are so close together, and so numerous, that they make it all look red to the eye. These tiny bodies are called **corpuscles**. The word *corpusculum* is Latin for little body. The fluid in which they float is called **serum.** The corpuscles and serum stand to each other in very nearly the same relation in blood, as the butter-cells and whey do in milk. Serum is the Latin for whey. It is considered that in a full-grown adult there are about

20 pounds of blood. Of this about 16 pounds would be serum, most of which is water, and the remaining 4 pounds would be corpuscles.

If blood be drawn from the body, the whole of it will not long remain liquid. It soon separates into two parts, a thin liquid and a thick **coagulum**, or clot. The Latin word *cŏăgŭlum*, means, that which holds or binds together. If you cut yourself slightly and allow the blood to remain, you know how very soon this clot forms. But in the clot there is something besides the corpuscles. They are all held fast together by numbers of little strings. The little strings are *fibrin.* They are of the same nature as the insoluble fibres of meat. The clot also contains **albumen**, a few salts, and a little iron. It is the fibrin which makes the blood clot so quickly, and if there were very much of it in the blood, it would either not run at all, or only very sluggishly. There is about half an ounce of fibrin in the blood, to every pound of albumen. The little corpuscles are very important to our life. Girls with cheerful, ruddy faces have plenty of them in their blood, but girls with pale faces have not so many. It is far better to have a happy, ruddy face than a pale, sickly one. But further, these minute bodies are food-carriers, if we may use such a droll expression. But it is true. They carry food or nourishment to the flesh and nerves of our frame, which is always wasting. Every action wastes a little bit. So you see, if the body were not ceaselessly repaired it would soon waste away. It must waste, for change is necessary to life. Poison kills because it hinders this necessary vital change.

Millions upon millions of these little red food-carriers are always at work carrying the materials necessary to repair the worn-out muscles and nerves of our bodies. The proper name for this nerve and muscle food is *Hæmatin*.[1] It is derived from a Greek word meaning blood. "The blood is the life," and it is a very wonderful thing that blood itself is alive. The blood obtains this necessary power of replacing worn-out tissue in the process of Digestion, from the food we eat. Did you ever think that the bread and meat, the sugar and butter, the water and milk, of your food, become ultimately converted first into blood, and then into the actual substance of your own body? Perhaps not. But it is quite true, you see, and very mysterious also. We cannot understand it. Nor can the wisest men understand it, in the end, very much better than you girls. When we have learnt all we can know about it, we feel what a very little we understand, and we feel, too, it is to be hoped, how fearfully and wonderfully God has made us.

There are, it may be repeated, about 20 pounds of blood in an adult, nearly four-fifths of which, or 16 pounds, are water. A very large proportion indeed of the whole body is water. Thus, if the weight of any one be 11 stone, or 154 pounds, the amount of water is 109 pounds, the proportion being rather more than 9 pounds to every 14 in our bodies. How important to us you see pure water is! It is indeed a necessity of life.

Now try and understand what is meant by this wonderful circulation of the blood. The **heart** is the cause of the circulation, the force-pump, if we may so call it, which sends the blood about. So let us describe it first. The heart is a conical muscular bag, about as big as the doubled-up fist. So if you double your right hand well together, that is about as big as your own heart. In a man it weighs from 10 to 12 ounces, and in a woman from 8 to 10.

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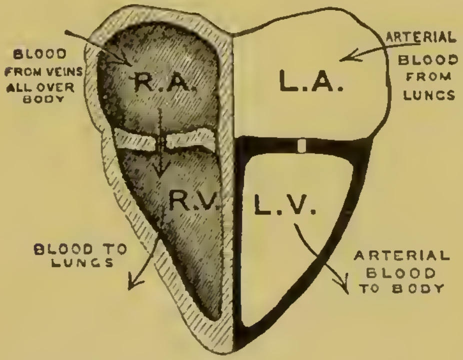
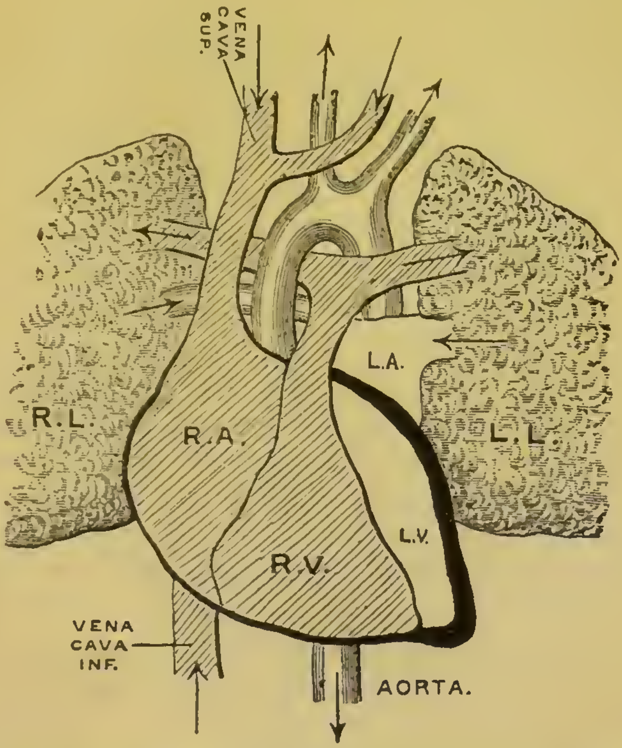
[1] The Hæmatin and Globulin of the red corpuscles are the food substance of muscle, nerve ganglia, and nerves. The other tissues are nourished from the serum.

It is divided into four separate cavities or chambers. Now look at the picture below; it shows you the inside, as it were, of all these chambers and their dividing walls. The upper chambers are called *auricles*, because they are shaped somewhat like little ears. The Latin word *auricula* means anything resembling an ear. The lower ones are termed *ventricles*. The Latin word *ventriculus* means a little belly or stomach. If you open the book and put it in front of you with the cover towards your bosom, the section will then just represent the position of these four chambers in your own heart. The letters you are to explain to yourselves thus, both in this section and in the diagram on page 29:—



R A, Right Auricle.
R V, Right Ventricle.
L A, Left Auricle.
L V, Left Ventricle.

That is the order in which you are to learn them. Now repeat them several times. You see also that the right side of the heart is shaded. That is meant to show you that the blood there is venous blood, impure blood brought from all over the body to be purified in the lungs. The other side contains the purified blood.



Let us now trace the course of the blood. The veins from every part of the body finally empty into two, one from the head, &c., called the *vena cava superior*, i.e. the upper hollow vein, which you will see at the top; the other and larger, called the *vena cava inferior*, or lower hollow vein, which you will see at the bottom of the diagram. These large veins are inside the body well out of danger. The arrows are to show you which way the blood is always running. When the right auricle is full, the blood is forced into the right ventricle, through a little trap-door, which opens to let the blood through and closes immediately. The right ventricle forces it into the lungs, both lungs, right and left, marked R L and L L on the diagram. Here it is oxygenated or purified. The lungs send it back to the left auricle, and the left auricle passes it on into the left ventricle, which sends it over the body through the **aorta** and other arteries. Why are the walls of the left ventricle made so thick in the diagram and section? Because that has the hardest work to do, and must therefore be stronger to do it. The left ventricle, by its contractions, has to send the blood to the tips of your fingers, and toes, and ears, and so has to be very thick and strong.

Now repeat the course of the circulation of the blood. Right auricle, right ventricle, lungs, left auricle, left ventricle, body. Thus there are two circulations.

1. The *Pulmonary* circulation, i.e. from the heart through the lungs (the Latin word for lungs is *pulmōnes*).

2. The *Systemic* circulation, i.e. from the heart through the rest of the system. The blood is taken from the heart by channels called *arteries*, which are mostly well hidden under the muscles, so as to be free from danger, for if an artery in any one's body were cut, and were to remain unbound a short time, the person would soon bleed to death. If it had to be bound, it should of course be tightly bound or pressed heavily between the cut and the heart. The blood, impure, full of waste matter from all over the body, returns to the heart through the veins such as those you can see on your hands. In a general way, if you cut yourself, the blood comes from a vein, and does not flow very fast, because the blood is not so strongly driven along in the veins as in the arteries.

At every beat of the heart, which you can feel if you place your hand on your left side, the two auricles contract together, and then the two ventricles. There are thus two beats, but we hear that of the ventricles only, as a rule. If, however, we listen very carefully, we might distinguish both—thus, pit-pat—pit-pat. When the heart beats the smaller end moves forward and upward against the side of the chest. The blood can never move in a wrong direction, on account of a number of valves which open only in the direction of the stroke.

The arteries continually branch and divide as they spread over the body, and the blood moves in them slower and slower, until at length it arrives at the capillary or hair-like vessels near the extremities, and there the veins begin. This circulation can actually be seen in the transparent web of the foot of a frog if it be placed under a microscope.

There are, of course, many things about this marvellous circulation that cannot be told you here. But a few more interesting facts concerning it may be advantageously added.

(1) One great thing to remember is, that the bright red blood in the arteries carries nutritive material and scatters its vivifying properties all over the body. When the blood returns it contains more carbonic acid from the burnt-up and waste tissues, and is changed from a bright red to a dark colour.

(2) Each chamber of the heart contains about 4 ounces. About the same amount of blood is sent into and comes from the lungs, as goes out of the right ventricle of the heart at each beat, and so the circulation is evenly regulated.

(3) The number of times the heart beats may be counted by the *pulse* in the wrist, or on either temple, or in the neck. The Latin *pulsus* means a push, or

stroke. In a man the pulse beats between 70 and 75 in a minute, in a child between 100 and 120; in a woman nearly ten more in a minute than in a man. The pulse beats more quickly when you run than when you walk, when you stand than when you sit; and during digestion than when you are hungry. How fast does yours beat? Count. It beats very slowly when you lie down and sleep, and very fast on sudden surprises of joy, sorrow, or anticipation. In these circumstances it may be partially checked by taking courageously a long succession of full, deep breaths.

(4) It is considered that all the blood in the body passes through the heart in rather more than a minute, probably in about a minute and a half, and, of course, it keeps on doing this regularly, slower or faster, from the time we are born to the time we die.

(5) It is necessary to the proper working of the heart that the blood be well oxygenated in the lungs. If it be not, as it is not when bad or impure air is breathed, the heart begins to beat slower. as if it refused to work under such improper conditions. If the air breathed become very bad indeed, the heart refuses to beat at all, and then the person is said to be suffocated, or in medical language, *asphyxiated.*

(6) You may, perhaps, like to know that the Latin word *artēria* means a wind or air passage. When an artery is cut in a dead person, it is found empty and distended; and so the old anatomists thought that what was called "animal spirits," went about the body in the arteries. Their walls are elastic and contractile, and when the force of the heart-beat is nearly lost the blood is forced on by the artery contracting on the blood, and so pushing it on to the capillaries, which are so small that they cannot be seen without the aid of a microscope.

LESSON VI.

RESPIRATION.

DERIVATIONS.

Structure.—Building up of any organic body. *Lat.* **struo, to build.**

Respiration.—Breathing. *Lat.* **respīro,** to breathe back.

Automatic.—Self-acting, involuntary. *Lat.* and *Gr.* **automaton,** a self-moving machine.

Inhaling, exhaling. *Lat.* **hālo,** to breathe; in = in; ex = out; **hālitus,** breath.

Delicate.—Weak, tender, nice. *Lat.* **dēlĭcātus,** delightful, charming.

Affections.—Pleasurable emotions, or states of feeling. *Lat.* **affĭcĭo** (ad facio), to touch mind or body.

Analyzed.—Resolved into its component parts; taken to pieces. *Gr.* **luo,** to loosen.

Membrane.—A thin film of skin, &c. *Lat.* **membrāna,** skin, parchment.

Pleurisy.—Inflammation of the **pleura,** i.e. the membrane lining the inside of the thorax, and covering the lungs.

Bronchitis.—Inflammation of the **bronchi.**

Congestion.—Literally, carrying together. *Lat.* **con, gĕro,** to carry about. Congestion of the lungs, or liver, or brain, is stagnation of the blood in those organs.

Convex.—Shaped like the outside of a circle, the inside of which is concave. *Lat.* **convexus,** rounded off.

Diaphragm, *Gr.*—The membrane between the chest and the abdominal cavity.

PRONUNCIATION. Exercise on *A W*, as in

a haw, law, a saw, maw, gnaw, dawn, draw, awl, claw.

"EVERY child knows that we must have air to breathe. Everyone knows how unpleasant it is not to have *fresh* air to breathe; but the mass of mankind have no conception that air which is not fresh, is as bad as poison."[1] But those who have read so far in this book will know this well enough, and it is to be hoped will put their knowledge into practice, or they would be better off without it. Knowing is good, but doing is far better. An ounce of right doing, is worth more than a pound of mere knowing.

This breathing of ours is very wonderful. We shall endeavour to explain as much as possible about it in this lesson, but we cannot explain the wonder of it. When we cease to breathe we die. The soul goes away to God, who breathed it into man at the Creation.

"The body is there, the form is there, the wondrous structure is there, but where is its activity? Gone are the graceful movements of those limbs, and the tender sweetness of those eyes; gone the rosy glow of youth; gone the music of the voice, and the gaiety of the heart. The mystery of Life has given place to the mystery of Death."

Respiration is the act of breathing, which consists of the automatic actions, viz. breathing in, or inhaling, or taking breath; and breathing out, or exhaling. The actions are automatic because they are not made by an effort of the will. We breathe without thinking about it, whether we will or not. We breathe in sleep, though much slower than when awake; we breathe faster standing than sitting, and much faster running than walking. We may run until we are *out of breath*, which means that we cannot get breath fast enough.

We can breathe either through the nose or through the mouth. But it is always best to keep the lips closed, and take breath through the nose. This fact should be remembered and acted on very carefully by all who have delicate lungs, or are liable to affections of the throat.

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[1] 'Physiology of Common Life,' p. 349.

You have already read something about the air we breathe. You know it consists of nearly one-fifth part of oxygen, and the remainder of nitrogen; or we may say about 20 parts in 100 of oxygen to 79 of nitrogen. The remaining part is vapour, carbonic acid, &c. You know too, that air is vitiated by being breathed over and over again, because it then contains an increasing amount of carbonic acid and other poisonous exhalations.

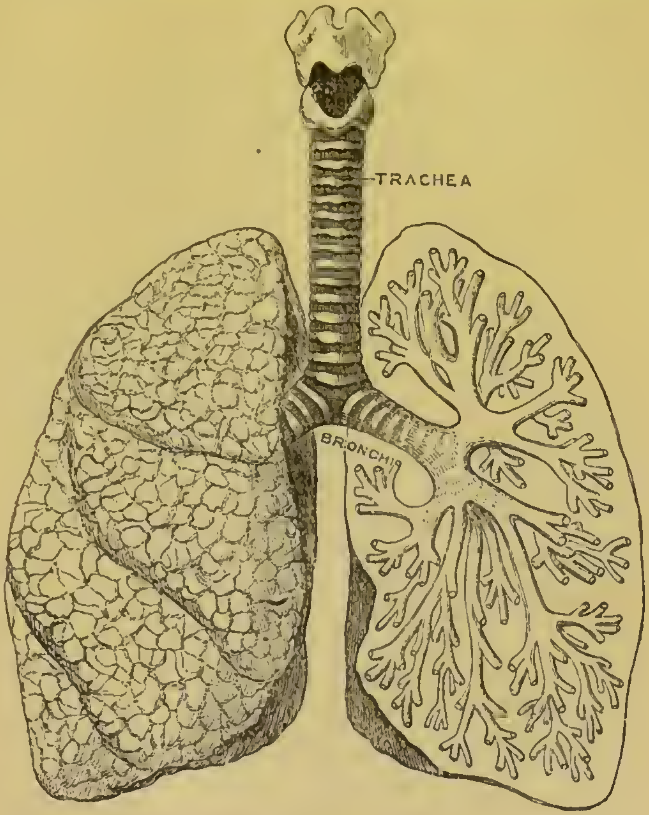
We have seen that we cannot live without breathing pure air. But why? We require fresh oxygen to purify our blood, as you already know, and we get it by breathing. If then the air we breathe-in be bad, the blood is improperly or insufficiently mixed with oxygen. Then disease of some sort must follow; slight, such as headache, at first; but if we breathe bad air long enough, suffocation, or *asphyxia* as it is called, ensues. The air of a room in which 50 candles had been burning two hours, and 500 persons breathing, was once analyzed, and it was found to contain one gallon of carbonic acid in every 100, instead of one gallon in every 2500, as there would have been in pure air.

In breathing, therefore, we exchange the carbonic acid which results from the consumption of waste tissue in the body for oxygen, which is required to render the blood pure, and to keep us warm by burning up food substances. It seems almost laughable to say that we burn up our food, as if each of us carried about a little fire. But you remember that burning a substance is combining it with oxygen. Animals breathe by means of their *lungs*. So we must now try and understand something about them. Each person has two lungs. If you press your open hands to your sides, as near your armpits as possible, and take a deep breath, once or twice, you will feel both lungs in motion. The lungs are suspended in and fill the chest. They are attached to it by the pleura, which surrounds each lung like a bag. The heart is also enclosed in a bag, and lies between the right and left lung.

Each lung consists of an immense number of tubes and cells, covered entirely with the outside membrane or *pleura.* Perhaps you have heard of *pleurisy*, which is the disease people have when this outer membrane of the lung is inflamed, as it may become, if a cold on the chest be neglected.

Now look at the diagram. You see the trachea, or windpipe, down which we breathe, branching off into each lung. These branches are called bronchi, or *bronchial tubes.* When they are inflamed people have the disease called *bronchitis.* Each of these bronchi divides and subdivides, until it is very small, and every tube ends in a little bundle of air cells, which look, when expanded, almost like a bunch of currants. Think of the trunk of a tree. It first divides into arms, then into large branches, then into smaller branches. These divide into twigs, and lastly come the leaves. This illustrates the tube and cell division in our lungs—and more, for the tree breathes through its leaves. But besides all these air tubes and air cells, there are also, all over the lung, and intertwined in every direction, blood-vessels, which continually divide and subdivide into smaller ones, until they are invisible to the naked eye. There are millions of them, and millions of the air cells. And it is in these little cells that the purification of the blood by oxygen is effected.

The blood in the tiny tubes, and the air in the very small cells, are separated by a little thin film of skin, or membrane as it is called, and through this the interchange takes place; that is, the oxygen out of the air passes into the blood, which thus becomes purified or vitalized; and the carbonic acid in the venous blood passes into the air and is breathed out in the breath. All this goes on incessantly in these very minute cells. It seems almost impossible to believe that the entire



area of these cell walls in an adult is 2642 square feet. We cannot understand one million, much less six hundred millions. There are nevertheless probably as many as 600,000,000 of these little cells in a pair of adult lungs.

You must see, therefore, how important it is that you should breathe pure air; or, instead of the blood becoming vitalized in the lungs as it ought, it will only be more poisoned. Then your head will ache, your face become white, and if this slow poisoning go on, you will of course die. When people take cold, this little membrane between the smallest cells of the lung sometimes becomes inflamed, and the circulation of the blood through it stops; and if this derangement spread very much, the whole lung may become involved, and then you would not be able to breathe at all in that lung. So you must be careful not to take cold. If, by any misfortune, you catch a cold, you must have it attended to at once, or it may land you in that terrible disease *consumption*. Remember that very many diseases begin by catching cold.

You have been told how small the little air cells are. It is said that about 3000 of them, placed side by side, would fill a space about an inch long. Their walls are described as delicate and transparent, which may well be believed.

The chest is separated from the abdominal cavity by a membrane convex to the former, called the *diaphragm*. The diaphragm and the ribs aid in the act of breathing.

You understand, then, that there are two circulations always going on in the lungs, viz. air in and out, and blood in and out: air in pure, and out impure; blood in impure, and out pure.

The following facts will perhaps interest you if you can remember them. They are taken from Professor Marshall's book.

1. The average quantity of carbonic acid given off in twenty-four hours from the lungs of an adult is nearly 25,000 cubic inches, containing about half a pound of carbon.

2. The quantity of oxygen absorbed by one man or woman is more than 27,000 cubic inches. But air once breathed loses one-fifth its oxygen, so that five times 27,000 cubic inches,.or 135,000 cubic inches, is required daily. Calculating 18 respirations a minute, of 25 cubic inches each, this gives 648,000 cubic inches, or 375 cubic feet (you know 1728 cubic inches make one cubic foot) in a day. But even this is not enough to preserve a man in good health. It has been found desirable to allow at least 800 cubic feet of air for each occupant of a working or sleeping apartment.

3. The quantity of vapour exhaled from the lungs of one man in twenty-four hours is usually from 14 to 20 oz., or more than a pound avoirdupois. This is not pure water, but it contains some organic or waste matter, and is very injurious if breathed over and over again.

4. Of course, all the air in the lungs is not breathed out at once. A continual interchange goes on. It is considered that less than one-fifth goes out at each respiration. Professor Marshall says, 20 cubic inches out of 170 cubic inches are exhaled at each breath by an adult.

5. The relation of respiration to pulse is about 1 to 4, which means that if you have 18 respirations in a minute, your pulse should beat 4 times 18, or 72 times. Respiration, it is worth repeating, is more active in

the country than in towns, more in pure than in vitiated air, more while you are standing and running than sitting or walking, more during the day than during the night, and more in boys than in girls.

If you wish to be in perfect health of mind and body, remember that the first necessity is perfect respiration. Surely when you have thought about this wonderful breathing apparatus you possess, you will be led to do your best to keep it in order. Surely, too, you will remember how abominably wicked tight lacing is. God gives you a good pair of lungs, and if you lace your stays too tightly, you squeeze them up, so that they cannot work properly. If you do this, you must not pray to be kept in health, neither must you, if you wilfully breathe bad air.

Your schoolmistress will perhaps tell you the story of the Black Hole of Calcutta, as an illustration of the necessity of fresh air. When the school is full of children, you must have some of the windows open, or it will be a Black Hole on a small scale.

Here is another real story.

In 1848 the steamer 'Londonderry,' plying between Liverpool and Sligo, with 200 emigrants on board, was overtaken by a storm. The captain ordered everyone down, and a tarpaulin to be fastened over the cabin entrance to keep the water out. But it kept the air out too. It is a dreadful story. No less than seventy-two were suffocated before the groans and cries reached the captain's ears. The whole is told very fully in vol. i., page 350, of Lewis' 'Physiology of Common Life.'

LESSON VII.

DIGESTION.

DERIVATIONS.

Dyspepsia.—*Lat.* or *Gr.* for indigestion.

Prehension.—Taking hold of. *Lat.* **prĕhendo**, to grasp, seize; **prĕhensĭo**, seizing.

Mastication.—Chewing. *Lat.* **mastico**, to chew.

Incisors.—Cutters, cf. scissors. *Lat.* **scindo**, perf. **scĭdi**, to cleave, tear, cut.

Canine.—Belonging to a dog, doglike. *Lat.* **canis**, a dog.

Bicuspid.—Having two cusps. *Lat.* **cuspis**, a point. Bi, two.

Molars.—Grinding teeth (cf. Eccles. xii. 3. *The grinders cease because they are few*). *Lat.* **mŏlāris**, a millstone.

Insalivation.—The process of mixing with **saliva.**

Epiglottis, *Gr.*—The fifth cartilage of the larynx.

Pharynx, *Gr.*—Upper part of the **œsophagus**, or gullet.

Gastric, *Gr.*—Belonging to the stomach.

Experience.—Proof by trial. *Lat.* **expĕrĭor**, to prove, to put to the test.

Alkali.—A substance which unites with and destroys or neutralizes acids.

Chymification.—The process of turning chewed food into chyme.

Pancreatic, *Gr.*—Belonging to the pancreas, or (in animals) sweetbread.

Intestinal.—Belonging to the bowels. *Lat.* **intestīna**, the lower part of the alimentary canal.

Chylification.—The process of turning partly digested food into chyle.

Thorax.—Throat, windpipe. *Distinguish* gullet, above.

PRONUNCIATION. Exercises on *A*, as in

harvest, dale, tallow, bath, path, was, grass, ash (tree), least, fast (firm).

Digestion is the liquefaction of food, so that it can be received into the vessels of the body. The Latin *digerĕre* means to dissolve, and to carry or spread about in different ways or directions.

We hear of some persons with good digestion, of others with bad digestion. The Latin word *Indigestio*, and the Greek word *Dyspepsia*, both signify inability to digest. Bad digestion is mostly a person's own fault. Children as a rule do not know anything about their own digestion—happily for them. Let us try to understand about it, and that we may do so the better we will consider it in the various stages into which it is naturally divided.

1. First, the food must be taken into the mouth. This is sometimes called **prehension**, or laying hold of. It is very interesting to study how different animals, birds, insects, and fishes, take food into their mouths.

2. The next thing is to chew it well. This process is called **mastication**. It is to be hoped that all girls who read this have been taught to chew, champ, bite, bruise, and crush their food well before swallowing it. It is wrong to eat too fast, because the food must be well broken up in the mouth before it can be duly acted upon by the operations of the stomach. Those who bolt their food run great risk of injuring their stomachs. But this is not all, for the food does not do them nearly so much good if swallowed insufficiently masticated. Those who eat too fast, often eat too much, and become greedy.

We masticate with the teeth. Now count how many teeth you have, and be careful to feel the difference in the tops of them as you put your finger round. Now have you found out how many teeth you have? The full number is thirty-two, sixteen in each jaw, eight on each side. But young children have only twenty in their first set of teeth, *milk teeth* as they are called.

Teeth are of four kinds. Those in front with the sharp chisel edge, are called

(i) **Incisors.** We bite with them, and have eight in all. Next on each side comes one tooth with a more pointed crown. It is called a

(ii) **Canine,** or dog tooth, or eye tooth. It somewhat resembles the holding tooth of a dog. We have four of these.

Then there are two teeth on each side, in each jaw, with two distinct points on the top or crown, one inside and one outside. These are called

(iii) **Bicuspid,** on account of these two cusps or points on the crowns. We have eight of them.

Lastly, there are what are familiarly called double teeth. The scientific name for them is

(iv) **Molars,** which means grinders. *Mola* is the Latin word for a mill, and *mŏlo* is to grind. They have two or more fangs, and either four or five points on their crowns. We have twelve of these in mature age. Perhaps you have only eight, because the last four, sometimes called wisdom teeth, do not come until the age of twenty or more.

Now count up:—incisors, 8; canine, 4; bicuspid, 8; molars, 12; total, 32.

Teeth are amongst the best servants we have, and we should treat them carefully. They deserve to be kept clean, and should be brushed twice or three times every day. The more fair work they do the better it is for them. Thus it is much better for teeth to have to grind hard crusts than soft food, like puddings. If cleanliness and good use were always given them, toothache would be much less common than it is.

3. While mastication of food is going on, it is mixed and moistened with a fluid poured out from the inside of the cheeks and from under the tongue, which is termed *saliva*. This process is called **Insalivation.** It is very necessary to the proper digestion of food, especially farinaceous food, which by the action of the

saliva is partly converted into sugar. Did you ever chew a piece of dry bread or biscuit until it tasted sweet? If not, do so. You will then better understand part, at any rate, of the process of digestion.

The flow of this saliva is interesting. It becomes secreted rapidly under the simple idea of savoury food; more still if we can smell the food. The contact of solid substances with the mouth causes it to flow rapidly. So, then, if you are very thirsty and take a pebble or a marble into your mouth it will cause a flow of saliva.

4. After food has been well masticated it is swallowed. It is prevented from going the wrong way, i.e. into the windpipe, by a little valve-like flap called the *epiglottis.* The act of swallowing is almost involuntary. Indeed, if the food be rolled far enough back on the tongue, it is laid hold of, as it were, by the muscles of the *pharynx* (as the top of the *œsophagus*, or tube which connects the mouth with the stomach, is called), and carried down. The stomach is a large membranous bag placed across the upper part of the abdomen. The largest end of it is on the left side.

The most important part of digestion may be said to begin there. In the stomach the food is mixed with *gastric juice*, and continually moved about backward and forward, and up and down, until it is converted into a uniform thick fluid. Every part of the food has to be brought into contact with the walls of the stomach, so that the gastric juice may be mixed well with it all. This juice is separated from the blood, secreted by a large number of minute bags, sacs, or cells, on the inner lining of the stomach. It is chiefly secreted and poured out when food is brought into contact with these little cells. If no food be taken, these sacs in time become too full, and it is this which is said by some to cause the sensation we call hunger. Gastric juice is something like the saliva, except that it is acid instead of alkaline. It is quite acid or sour to the taste, as some or all of you may perhaps know from experience. It contains, besides salts, a peculiar substance called *pepsin*, which seems like altered albumen. It is necessary to the digestion. Indigestion is called Dyspepsia, because it is digestion badly performed. Gastric juice dissolves albuminous and fibrinous constituents of food. What are called condiments serve to make the gastric juice flow more freely. But the best sauce is a good appetite, and it is best to do with as little condiment as possible.

The soft, pulpy substance formed in the stomach out of the food is called *chyme*. In this state it is something like cream if the food have been rich ; or like gruel if it have consisted of rice, potatoes, &c.

Gastric or stomach digestion is called **Chymification.**

5. The chyme is next passed on into the intestines ; i. e. such part of it as is not taken up by the walls of the stomach itself, and converted into blood. But this is not much. The intestinal tube consists of the small and the large intestine. It is in the former that the most important part of the whole process of digestion is performed. The chyme is kept continually moving along it, and it is mixed with three more fluids. There is first the **bile,** which is secreted by the liver. It is poured from the bile duct and gall-bladder into the intestine. It takes away the acidity which the chyme acquired from the gastric juice, and helps to change the starchy particles into soluble sugar. The second is called the **pancreatic juice.** It is something like saliva. The bile and this together change the chyme into a thick liquid by dissolving the oily and other

particles. The third is the **intestinal juice,** which dissolves albumen and finishes the change of any remaining starch into sugar. The whole substance of the food is made quite liquid by these several agents, and is in a proper state to be taken up by the little absorbent vessels all over the inner side of the smaller intestine, which is about six times the length of the larger one.

This liquid is called *chyle.* The intestinal or final digestion is called **Chylification.** Chyle is a sort of thick, milky liquid, and is rapidly absorbed from the lining of the intestine by proper vessels. But how does this milky substance become turned into red life-giving blood? All the properly digested chyle is taken up and collected together into one channel in the interior of the body just in front of the spine. The chyle is poured into and mixed with the blood just where the great vein of the neck meets the veins from the arm on the right side.

Chyle contains about 90 per cent. of pure water, 3 or 4 of albumen, 3 of fatty matter, and 3 of other animal or saline substances. Do not forget how much of it is water, which is, you see, a real food, and one that we could least well do without, as it forms the means of conveyance of the nourishing particles to every part of the frame.

By the time the chyle reaches the central receptacle, it becomes more and more like blood. It coagulates, for example, more easily, because it contains more fibrin and albumen and less oily matter.

You know something about the circulation of blood already. Thus you see the food you eat is by all these different processes converted into the very substance of your body.

LESSON VIII.

EXCRETION, OR SEPARATION OF WASTE BY DIGESTIVE APPARATUS, SKIN, LUNGS, AND KIDNEYS.

DERIVATIONS.

Derivations. — Words derived from others or older ones called roots. *Lat.* **rīvus**, a small stream.

Peristaltic, *Gr.*—Wriggling; a peculiar onward propelling action.

Predominant.—Overpowering, overmastering, prevailing. *Lat.* **dominus**, a master.

Consumption.—Wasting away. *Lat.* **con, sumo**, perf, **sumpsi**, I take.

Consequences.—Results, effects. *Lat.* **consequor**, to follow.

Separating.—Dividing, placing apart. *Lat.* **sēpăro**, put apart, divide.

Kidneys.—The organs which separate the urine from the blood.

Reprehensible.—Blamable. *Lat.* **reprĕhendo**, to check, hold back.

Absurdity.—Stupidity, nonsense. *Lat.* **absurdus**, dull, senseless, foolish.

Prudish.—Over-scrupulous, mock-modest. *Lat.* **prūdens**, foreseeing.

Modesty.—A lovely virtue. *Lat.* **modestia**, keeping within due bounds.

Preventible.—That which may be hindered. *Lat.* **præ**, before; **venio**, to come.

PRONUNCIATION. Exercise on *A*, in

a raven, after, any, thatch, father, late, Saturday, water, what, fat, gnat, he lay.

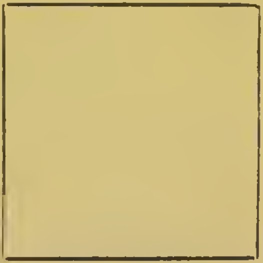
Secretion is the formation from the blood of various fluids, &c., required for the economy and due performance of vital functions. **Excretion** is the separation from the body of the undigested or waste and used-up material. The Latin verb *cerno*, perfect *crevi*, from which these words are derived, means to sift, winnow, separate. We have the same root in discern, concern, &c. *Se* means apart, and *ex* out. These processes are necessary to the proper healthy continuance of life.

As the process of intestinal digestion goes on, the contents of the small intestine are continually moved forward and onward, by a curious sort of wriggling movement of its walls, called the *peristaltic* motion. The amount of chyle gradually diminishes, and only insoluble or indigestible particles are left, and these are in due course removed. **This removal ought to take place at least once a day.** If you will remember this one fact, and attend to it regularly, it will save you many illnesses. The first thing a doctor invariably does, is to see that waste matter is removed. If a watch or clock won't go, it is most likely because some dust or waste oil has clogged up the wheels. The machinery of the human body is far more complex than that of a watch.

The excretory organs proper are the **skin,** the **lungs,** and the **kidneys.**

1 We have first to consider the action taken by the **skin** in removing waste. I hope you remember Lesson II. in Standard IV.—"*The skin without and the skin within.*" You had better read it again. It is worth while that you learn it by heart; remember it well, and put in practice the hints it gives.

The skin consists of two layers, called the *epidermis*, or scarf skin, and the *dermis*, or true skin. The Greek word for skin is *derma.* The first is thin, and is continually being rubbed off in little scaly pieces with the towel, when we dry ourselves after a bath or a wash. The last is thicker, and contains embedded in it the *sweat glands*, little bags full of water; the *fat* *cells*, little bags full of oily matter which exudes and keeps the skin smooth and moist when it is clean; and the roots of the little hairs. Each of these glands and cells has its opening on the surface of the skin, though it is too small to be easily seen. It is estimated that there are about two and a half millions of sweat glands on an adult body. They are most numerous on the skin of the palm of the hand and the sole of the foot. If you will look carefully at the palms of your hands I dare say you will be able to trace the small ridges which are full of them. There are said to be between 2000 and 3000 on every square inch, i.e. in a space as big as this—



These minute glands and tubes are always at work if they be not stopped up. The glands separate water from the blood; the tubes empty it out. The perspiration comes out either insensibly, i.e. so as not to be seen (this is always going on day and night), or it collects as it comes out in little drops, as you may notice upon your hands and faces when you run fast or play heartily. The food we eat and drink is first converted into blood, and then when the blood has performed its life-giving and waste-restoring functions, the sweat is removed from it, and passes away. Sweat consists mainly of water, but it also contains carbonic acid and a minute quantity of urea, which is a solid, and arises from the consumption of the bodily tissues, which you know is the result of even the smallest bodily action. If, then, you do not keep your skin clean these are the consequences. First, the little tubes will be choked up; then the water which should come out must pass off from the lungs or through the kidneys. But they have enough to do with their own proper work. If they have more to do something will go wrong, and you will be ill, in one way or another. If, then, you know what is right to do, and don't do it, whose fault will it be when you are ill?

2. But, secondly, the **lungs** are continually at work in separating waste from the blood. You remember, it is hoped, the Lesson on Respiration. If not, let it be read again. At every breath you give out, there comes from your body some water, some carbonic acid, and a minute quantity of solid matter. These waste matters are separated from the venous blood in the lungs. They are brought thither from all over the body, and must be got rid of. The carbonic acid, and the solid matters given off by the lungs, result from the consumption of the tissues; just in the same way as those which are given off by the skin.

Professor Huxley tells us that "Taken by weight, water is the predominant excretion in all these excretory organs. Most *solid matter* is given off by the *kidneys;* most *gaseous matter* by the lungs." It follows that much water is given off by the skin.

But we could not do without any of these organs. If the skin were varnished over we should not live long. When the lungs are diseased we soon die by what is called, and rightly enough, *consumption*, one of the most terrible of English diseases. Do not forget that it is very frequently the result of carelessness or ignorance. Some law of health is broken, some physiological principle is violated, and death is the necessary and natural consequence. Just as pure water is needed to keep the skin in a proper state of healthy activity, so pure air is necessary for the lungs. Any impurity, however slight, must be paid for in the long run. Nature exacts unsparing vengeance. She never forgives, because she cannot. All that she can do is to repair, and this goes on incessantly, as we have seen.

3. We come lastly to the **kidneys**. There are two kidneys, one on each side, placed near the spine, and nearly at the bottom of the interior of the body. From the middle of each a long and narrow tube, called the *ureter*, passes to the bladder, a small oval bag formed of abundant muscular fibres. The kidney is always at work separating waste matter from the blood; and as it is separated, it is poured in solution, drop by drop, into the bladder. Thus the kidneys are a species of filter. It is said that an average healthy adult, excretes by the kidneys, not less than fifty ounces in twenty-four hours.

The excretion is mainly composed of water, but it also contains two other chief substances, one of which is urea, the other uric acid. These both consist of the elements carbon, hydrogen, nitrogen, and oxygen, but urea is the most soluble, and greatly exceeds the uric acid. This water also contains small quantities of saline and other matters, such as "common salt, phosphates and sulphates of potash, soda, lime, and magnesia." Urine may be described as blood deprived of its corpuscles, fibrin, albumen, and iron. These are required to nourish the body, and they are therefore left by the blood wherever they are needed. The remainder is, of course, waste, and must be removed. The lungs take away the carbonaceous waste matter from the blood. The kidneys remove the urea and uric acid. **This waste ought always to be removed as soon as nature requires it.** Let this be well remembered. Frightful diseases result from what is, with gross and reprehensible absurdity, considered by some prudish people to be modesty. How can modesty, which is holy and good, lead anyone to do a wicked and wrong thing?

There are many other important things that you should learn in order to become well acquainted with your own bodies. But they cannot be told you here. If you will remember and act upon these few that you have read about already, you will be so far well informed, and if you carry them into practice you will be wise. Ignorance in your case is another name for wickedness. There is much preventible disease; many early, miserable, and painful deaths; much dreadful suffering to the young, caused by wilful ignorance of the commonest laws of the body. Some people appear to shun knowledge of their bodies, as if human bodies which God made were evil, and their beautiful workings and laws were sinful. Never imitate that habit. It is a wicked habit. Ignorance is wrong. Knowledge is right, at any rate if it be rightly used. It is possible, of course, to make the holiest things wicked by vile using.

The following table may help to illustrate the proportions of solids, liquids, and gases given off by the three chief excretory organs of an adult in twenty-four hours:—

	Lungs.	Skin.	Kidneys.
Solids	Very little	20 grains	500 grains
Liquids	9 ounces	18 ounces	50 ounces
Gases	12,000 grains	400 grains	6 grains

STAGE I.

(*Code*, *p.* 28. 1877.)

§ 1.—FOOD AND ITS PREPARATION.
§ 2.—CLOTHING AND ITS MATERIALS.

§ 1.—FOOD AND ITS PREPARATION.

LESSON I.

FOOD: ITS NECESSITY, SOURCES, KINDS, USES, AVERAGE QUANTITY REQUIRED.

DERIVATIONS.

Classification.—Arrangement into classes. *Lat*, **classis**, a class; **făcĭo**, (ficio) to make.

Operations.—Work done, functions performed. *Lat.* **ŏperatio**, work, labour.

Structure. Animal or vegetable tissue. *Lat.* **strŭo**, to place one thing on another; **structūra**, fitting together, adaptation.

Essential.—That without which a thing cannot be what it is. *Lat.* **esse**, to be; **essentia**, being.

Indispensable.—Necessary, that cannot be spared. *Fr.*

Plastic.—Moulding, forming, making. *Gr.* **plasso**, to form, mould.

Emaciation.—Wasting away. *Lat.* **măcio**, to make lean.

Ingredients.—Constituents. *Lat.* **ingredior**, to step in.

Glucose.—Grape sugar. *Gr.* **glukus**, sweet.

Emulsion.—A milk-like mixture. *Lat.* **mulgĕo**, perf. **mulsi**, to milk.

PRONUNCIATION. Exercise on *A* and *AI*, in

dare, arm, warm, yard, all, may, day, dray, fair, the hail, snail, nail, tail.

No fact is better known than that food of some kind is necessary to the preservation of life; though much requires still to be known on the kinds of food, on the best ways of making it palatable, on the quantity it is necessary to eat and drink. There is no greater cause of action, among all the races of which mankind consists, than the universal desire for, and the necessity of, food. Every girl, therefore, ought to learn as much as she can about it, and especially how to choose and cook it to the greatest advantage; for much of her own happiness and of the happiness of those with whom she is and will be connected, is dependent on good food, well cooked. Food is to the human body what fuel is to a fire. If wood, coal, or coke be not put on the fire it will go out. If proper and wholesome food be not supplied to the body its life will also go out, or, as we say, it will die.

Food may be classified as **vegetable, mineral,** and **animal.**

Bread, potatoes, greens, are vegetable food.

Salt and water are mineral food.

Flesh, butter, milk, are animal food.

But this classification tells us only the sources from which our food is obtained. It tells us nothing of the different operations or actions of the various kinds on our bodies.

You have already read something of the difference between animal and vegetable life. It is the office of the plant to convert inorganic matters, such as water, carbonic acid, and ammonia, &c., into organized vegetable structure. It is in the plant that matter becomes organized, and capable of supporting higher life. The green parts of the plant, under the action of sunlight, perform this wonderful operation, the most remarkable change that ever takes place in the condition of matter, and one which, with all the study that has been bestowed upon it, is as mysterious as ever. God said, "*Behold, I have given you every herb for meat.*" This is simple enough.

The interdependence of vegetable and animal life is thus manifest. The rejected and waste matter of animals constitutes the essential and indispensable food of plants. Thus in the economy of creation a perfect balance is kept up. "While the animal lives, it exhales from its lungs carbonic acid." When it dies the soft parts of its body become converted into water, ammonia, and carbonic acid; and these are taken up as food by a fresh generation of plants.

The body is continually wasting. Waste or change is one of the necessities of life. Every motion, whether voluntary, as in walking, running, or working; or involuntary, as in the beating of the heart, or taking breath, is accompanied by some waste of the substance of the body. When a small particle of the body has done one action it is destroyed in the act, and must pass away and give place to another.

This constant and unceasing waste, necessitates as constant and unceasing repair and removal, in the whole frame, by the deposition of vital matter from the blood. The red corpuscles of the blood convey part of this matter. There are countless millions of them, always and sleeplessly at work, taking the right kind of material just to the most vitalized structures of the frame. It is the oxygen in these red corpuscles which sends them along so fast, and enables them to burn up and bring away the waste carbonaceous parts of the worn-out structures.

The body requires not only to have its waste repaired, it also requires to be kept warm. It is almost impossible to say which of these is the more important, for unless the waste were supplied the body would soon die; and unless the warmth were kept up the waste could not be supplied. Men have died because they could not get food, and others with plenty of food have been frozen to death.

It is on this account that food has been divided into two classes, and the names **flesh-formers** and **heat-givers** have been applied to them. It is to be remembered, however, that there is no hard and fast line between the two kinds; for flesh-forming foods also help to give heat, and heat-giving substances also help to form flesh.

The FLESH-FORMERS, or, as they were called by Professor Liebig, a famous German chemist, **plastic principles of nutrition,** are **vegetable fibrin, albumen, casein,** &c., and **animal flesh** and blood.

The HEAT-GIVERS are **starch, sugar, gum, fat,** and in some sense also alcohol. These substances do not form flesh.

"In the flesh-eating animal the waste of the tissues is very rapid," the temperature being in part kept up by the constant burning of azotized or nitrogenous matter.

When the muscular movements of a healthy animal are restrained, a warm temperature kept up, and plenty of good food given, it rapidly becomes fat. This is exemplified in pigs and stall-fed oxen.

On the other hand, when there is much bodily exercise and insufficiency of food, emaciation results. These effects are ascribed to the activity of the respiratory organs. In the first case heat-giving food is supplied faster than it is consumed, and therefore accumulates in the form of fat. In the second the creature is kept lean by the rapid consumption of all the heat-giving food it receives. It is the starch and sugar of the food that are converted into fat by the various processes in digestion; and what is true of animals applies to men and women, boys and girls.

Food, then, is necessary to our life. We obtain it from plants and animals. In the latter case it is much more nutritious than in the former; because the animal has already changed the vegetable substances into a form which makes it more easily digested and assimilated by man.

There are three kinds of food, as has already been stated, if we regard its origin, viz. vegetable, mineral, and animal; but only two kinds if we regard its functions in the human body, viz. flesh-forming and heat-giving.

The use of food is familiar to everyone, and its proper use should guard everyone, too, against its abuse. Those who eat improperly cooked food, and more especially those who eat too much, abuse it. Those who eat too much, should try to remember that they are robbing those who have not enough, as well as injuring themselves.

The *quantity* of food required necessarily varies in the same person under different circumstances; thus more is needed when the body is active than when in a state of repose, and in cold than in hot weather. Professor Huxley estimates that a person of average size requires daily

4000 grains of carbon.
300 „ nitrogen.

Supposing a man to take meat alone, he would be compelled to digest nearly 6½ lb. in order to obtain the requisite supply of carbon, but by this means he would then have nearly four times the needful quantity of nitrogen. Hence extra work would be given to the excretive organs to discard this really valuable matter as waste. Or if bread were eaten as a sole food in order to get the proper quantity (300 grains) of nitrogen, the man must be burdened with 9000 grains of carbon, or more than double the quantity necessary. A combination of bread and meat is therefore much more economical, so that ¾ lb. of meat and about 2 lb. of bread would supply the needful quantity with but very little waste.

We do not mean absolutely to lay this down as an unalterable law, for it is impossible to prescribe fixed rules as to the exact amount that should be taken by each individual as daily rations. A healthy appetite is the best guide, and it is a mistake to force food when the stomach suggests that enough has been eaten. "Enough is as good as a feast." And sufficiency, without excess, of a due admixture of animal and vegetable food, will be found to be not only the most palatable, but also the most conducive to health and strength.

Note.

Our Consumption of Foreign Food.—Official returns show in detail the increase in the last ten years in our consumption of various imported articles of food. The consumption of foreign and colonial wheat and wheat flour (the imports, less the exports) increased from 140 lb. per head of population of the United Kingdom in 1867 to 203 lb. per head in 1877. This last quantity is unusually large, but it is to be noted that it is now seven years since it was (in 1871) below 160 lb. per head. The consumption of raw sugar has risen from 40 lb. per head in 1867 to 54 lb. in 1877, and of refined sugar from 3 lb. to 11 lb.; of tea, from 3·68 lb. to 4·52 lb.; of eggs, from 13 to 22 in number; of potatoes, from 5 lb. in 1867 to nearly 27 lb. in 1877; and though this was exceptionally large, the quantity has never fallen below 13 lb. per head since 1871. The import of rice has risen from 6 lb. per head in 1867 to 13 lb. in 1877; of bacon and ham, from 2 lb. to 8 lb.; of butter, from 4 lb. to 5 lb.; of cheese, from 3 lb. to 5 lb. The population of the United Kingdom was in 1871 over 30,000,000.

LESSON II.

ANIMAL FOOD: HOW TO CHOOSE IT. PRESERVED MEAT.

DERIVATIONS.

Nitrogenous.—Containing nitrogen. *Gr.* **nitron**; **gennao**, to produce.

Capillary.—Having the fineness and delicacy of hair. *Lat.* **căpillus**, the hair.

Mastication.—To crush food with the teeth. *Lat.* **mastĭcātĭo**, a chewing.

Sedentary.—Motionless, inactive. *Lat.* **sedeo**, to sit. *Fr.* **sédentaire**, inert.

Formidable.—Something to be feared or dreaded. *Lat.* **formīdābĭlĭs**, causing fear.

Statistics.—Numerical statements of facts, &c. *Lat.* **stătŭo**, to set down as certain.

Hermetically.—Closed so as entirely to prevent the admission of air.

PRONUNCIATION. Exercises on *AI* and *EI*, as in either, slain, main, again, brain, said, maid.

IT is generally acknowledged by all who have given the subject their attentive consideration that meat, in certain proportions, is a very useful if not quite a necessary constituent of our diet. A larger amount of nourishment may be obtained from a given quantity of meat, than from the same weight of any other food-stuff. Thus bread is the most nutritious of vegetable productions, but beef is three times as valuable as a flesh-former; for one pound of beef contains as much *nitrogenous* matter as three pounds of bread.

If we compare the cost of the two we find that bread is more economical in a money point of view. Good English beef costs from 10*d.* to 1*s.* per lb. in the present day, and the 4-lb. loaf (quartern) is 8*d.*, or 2*d.* per lb.

So called **butchers' meat** is the flesh of the ox, sheep, calf, or lamb. The flesh of the pig also, either as pork or bacon, is a very important food; and it is the chief if not the only meat of many of the poorer inhabitants of this country. The pig has sometimes been called the Cottager's Friend, and Rent-payer. The deer, hare, and rabbit also yield food.

Now, perhaps it will interest you to hear something about fresh meat just as it is sold.

A joint of fresh meat consists of muscle interspersed with more or less fat. Dark meats, such as beef, are of a fine red colour when freshly killed, because the tiny capillary vessels contain a small quantity of blood.

The white appearance of veal is due to the cruel practice of bleeding calves, day after day, and then killing them. But this is now not so much done as formerly, because people are beginning to dislike cruelty to animals in any shape. When nearly all the blood has been removed, the meat is less nourishing, and besides this has lost some of its flavour. Thus the cruelty punishes itself, as it should do.

Some kinds of meat are digested more quickly and easily than others. Mutton ranks first in this respect, and hence it is more frequently ordered than any other for invalids or persons of delicate digestion. Veal and pork are the least digestible. Possibly this is in some measure owing to the elasticity of the fibres, which prevents them from being properly *masticated.* The best way to escape the penalty of indigestion from eating veal or pork, is to cut the meat into small pieces and masticate every piece well, before swallowing it. Let it be carefully remembered that any food swallowed insufficiently masticated, is always partly lost, partly harmful.

There is a great deal of difference in the flavour of the flesh, not only of various animals but also of different parts of the same animal. Of course, the more delicately flavoured joints are sold at the highest prices. The greater the demand for any particular joint the dearer it is. Thus, in the West-end of London, or the fashionable districts of other large towns, there is at the shops supplying wealthy customers a great demand for the best joints, such as loin and leg of mutton, fore-quarter of lamb, sirloin and ribs of beef, and fillet of veal. As there will be more of them to sell, the inferior pieces may be bought at such shops somewhat cheaper than in lower class ones. In the poorer localities, where there is a general call for such joints as aitch-bone, or brisket of beef, neck and breast of mutton, instead of the prime parts, the difference in price between the two qualities is less.

We will now say a few words about the chief kinds of meat.

Beef, as the flesh of the ox is called, has been the national meat in England for ages. It is an ancient and well-established custom in all classes of society, from the highest to the lowest, to make roast beef and plum pudding our Christmas fare. Even the Queen has a baron of beef served at her table on that festive occasion. At the Lord Mayor's civic feasts, too, baron of beef[1] is one of the chief dishes.

Beef is very wholesome and the most nutritious of all meats, and it is suitable for supporting persons engaged in exhausting physical labour. Delicate persons, however, find it too heavy to be readily digested. Hence when beef is really necessary for the sick, it is usually given as an essence, or in the form of beef tea.

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[1] Baron of beef, is a term given to the two sirloins undivided down the backbone, and thus answers to saddle of mutton.

The flavour of beef is fuller and richer than that of any other meat. The fibres are coarser certainly, but they contain much fibrin, which is very similar to the gluten of wheat, and therefore is a flesh-forming material.

It is instructive to note that the live animal bears a name of Saxon origin, while the term for the flesh is Norman. You must read the interesting extract from 'Ivanhoe,' which is printed after this lesson. It shows that the same is truo of pig and pork, the first word being Saxon and the last Norman. Also the same remark holds good of calf and veal.

Mutton is of a paler colour and of a finer texture than beef, and its fat is whiter and less oily. Its flavour is more delicate, and it is better adapted to the needs of persons who follow sedentary occupations.

Sad diseases have attacked our flocks and herds of late years. Tho most formidable are the cattle plague or rinderpest, and foot-and-mouth disease amongst oxen; and the rot and small-pox among sheep.

We should be careful when and how we choose our meat, for it is very dangerous to eat the flesh of diseased animals, or even to drink their milk. Some persons who have taken such food without knowing it, have been made dangerously ill thereby.

So important a matter is this, that Government has appointed inspectors, with authority to seize in tho markets any meat unfit for food. Still, some escapes their notice, and unprincipled tradesmen buy it, and are cruel enough to sell it to poor people who cannot afford to pay a high price, or else they chop it up into sausage meat.

Whenever a butcher is discovered selling bad meat or sending it to a market, he is usually imprisoned, as he deserves to be, without option of fine.

Perhaps it will be well to consider now some of the **characteristics of good meat,** so that when you go to market you may exercise some judgment in the selection. First, the joint should look well, and the colour should be fresh and bright. But you must remember that the lean parts of mutton are paler than those of beef. Next, the substance of all meat should be plump and elastic to the touch. If it be flabby or watery looking, it is not good. A good joint of beef should have a marbled appearance, from the little veins of fat interspersed with the lean.

When the fat in joints is firm, they are more suitable for hanging, because solid fat keeps longer than loose or oily fat.

The relative economy of one joint to another is in the proportion of lean to fat-tissue and of both to the weight of bone. Bony joints, as aitch-bone, brisket of beef, or neck of mutton, are of course sold at a lower price per pound than those with less bone. Many pieces may be obtained at a cheaper rate than that charged for joints, and they are most suitable for soups, or Irish stews, or potato pies.

There is not so much nutriment in **lamb** and **veal** as in more mature meats, still, they are in great demand in our markets as affording an agreeable change from beef and mutton.

Pork, the flesh of the pig, has been eaten in England from very early times. The chief wealth of the Anglo-Saxons consisted in immense herds of swine, which roamed in the woods and fed on acorns and beech mast, under the care of a swineherd. On the Continent, too, pork is highly esteemed by the working classes. In some parts the pigs belonging to many families are tended by one herdsman, who removes his droves to fresh pastures when necessary. An amusing story is told of an attempted theft from such a herd. The thieves brought a boat up the river which flowed by the waste land where the pigs were feeding, and seized several of the finest porkers. The unhappy swineherd discovered his loss when the robbers had pushed off from the banks. He immediately sounded the horn which he used for collecting his pigs, and the animals, hearing the well-known call, rushed to one side of the boat, which capsized. The pigs then quickly reached the shore, leaving their captors floundering in the water, as they richly deserved.

The flesh of the pig is used as food in three different forms. First, before it is weaned it is called sucking pig, when it is exceedingly rich and delicate in flavour. Secondly, pigs from six to eight months old are fattened for killing, when the joints are sold fresh as **pork.** This kind of meat is, however, much fatter, and therefore not so nourishing as an equal quantity of mutton or beef would be. It is very good, nevertheless, if eaten with plenty of greens, potatoes, and bread. The choice of pork requires care; for pigs are subject to measles, and the minutest inspection cannot always ensure a buyer against the presence of this disease in a joint. Thorough cooking is the best means of preventing any evil resulting from the consumption of pork.

Thirdly, large numbers of pigs are fattened for killing to make **bacon.** For this purpose they are kept and fed eighteen months or two years.

The sides of the pig are salted and smoked, when each one is known as a **flitch.** The legs are sometimes cut out and cured separately, when they are called **hams.** That is, the two hind legs are hams, and the two fore ones, which are not so good, are called shoulders. A farmer or labourer would laugh at the notion of having four hams from one pig. But many so-called hams, now sold in shops, are shoulders, or fore-leg hams. They are sent from America, as well as from Germany, Holland, &c., in large numbers.

Bacon is exceedingly agreeable to the taste, and is valuable, because it will keep for a long time in a dry place without losing its value as a food. The modern method of salting and drying is much more rapid than the old-fashioned system. Six weeks will complete the processes of salting and curing as performed in some of the largest bacon factories in Gloucestershire and Wiltshire.

A comparatively small proportion of the bacon consumed in England is produced at home. Much is imported from America and Ireland, of which the last-mentioned is considered the best. The flitches are sometimes landed in the west of England from Cork, packed in salt, and thus only partially cured; such bacon is called green, i. e. undried and unsmoked.

II.—Preserved Meats.

The dense and rapidly increasing population of our island home, renders it quite impossible that all the food required can be of home production. Large quantities of fresh meat are imported annually into the United Kingdom from less thickly populated parts of the globe. The following *statistics* will give you some idea of the vast nature of this trade. During the three months ending June, 1877, besides living animals from the Continent, 456,717 cwts. of meat were imported. Most of it came from the United States of America.

The most recent triumph in the introduction of fresh American meat is the application of cold to retard putrefaction. Ice-cooled chambers are used for storing the meat. The invention has proved most successful, and it may be confidently hoped that the trade will soon be thriving and extensive. A steam vessel from New York entered the London Docks in August, 1877, having on board the carcases of 400 sheep, and 1200 quarters of beef, preserved in this way.

Much **preserved meat** comes from our Australian colonies. Immense tracts of country there furnish feeding grounds for thousands of sheep and oxen. Formerly the animals were slaughtered for the sake of their fat, which was exported as tallow. When the urgent need for meat arose, attempts were made to preserve some of it, so that it might be used in England.

Among the earliest plans for preservation in South America was *drying*. Slices of flesh were cut from the animal and dried in the sun or in hot chambers. This was called jerked beef, but was not much liked, for it was dry and tasteless. All the rich nourishing juices of the meat were lost in the operation of drying, and sometimes also an unpleasant flavour was developed during the process.

Salting is our general method for preserving meat for a short time. This makes the fibres shrink and squeeze out the juices, which are lost in the brine. After a time the salt liquor helps to decompose the meat, so this method is unsuitable for the preservation of meat intended to travel great distances.

Australian meat is sent to us now in *hermetically sealed tins*, i. e. in perfectly air-tight and air-exhausted tins. In Australia there are large factories, where the meat is prepared and tinned ready for exportation. The most famous brand is the Ramornie. The tins may be purchased containing from 1 lb. to 6 lb. at the average price of 8*d.* per lb.

Before closing this lesson it would be well to remind you that **meat safes** are very valuable. To be useful they must be cool, airy, and dry. The close air of ordinary cupboards soon taints meat, which of course then becomes wasted.

Meat should always be protected from the attacks of flies, and for this purpose nothing is so effective as a wire gauze safe. But this is rather expensive, and a light covering of muslin is a cheap and effectual substitute.

At pages 355 and 356 you will find excellent recipes for making seven different dishes out of preserved meat.

III.

The following conversation between Gurth, the swineherd, and Wamba, the jester, taken from Sir Walter Scott's 'Ivanhoe' (a story you must all read some time), will show you, in an interesting way, the meaning of some of the names applied to live animals, and their flesh when killed, and the historical reasons for the difference:—

Said Gurth to Wamba—

"Wamba, up and help me an'[1] thou beest a man; take a turn round the back o' the hill to gain the wind on them, and when thou'st got the weather-gage, thou mayst drive them before thee as gently as so many innocent lambs."

"Truly," said Wamba, without stirring from the spot, "I have consulted my legs upon this matter, and they are altogether of opinion that to carry my gay garments through those sloughs would be an act of unfriendship to my sovereign person and royal wardrobe;[2] wherefore, Gurth, I advise thee to call off Fangs,[3] and leave the herd to their destiny, which, whether they meet with bands of travelling soldiers, or of outlaws, or of wandering pilgrims, can be little else than to be converted into Normans before morning, to thy no small ease and comfort."

"The swine turned Normans to my comfort?" quoth Gurth; "expound that to me, Wamba, for my brain is too dull, and my mind too vexed, to read riddles."

"Why, how call you these grunting brutes running about on their four legs?" demanded Wamba.

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[1] i. e. If, contracted from *gifan*. We use the *if*.

[2] A jester would be gaily clothed, and unfit to walk in the mud.

[3] The dog

"**Swine,**[1] fool, swine," said the herd; "every fool knows that."

"And swine is good Saxon," said the Jester; "but how call you the sow when she is flayed, and drawn, and quartered, and hung up by the heels like a traitor?"

"Pork," answered the swineherd.

"I am glad every fool knows that, too," said Wamba. "And **pork,** I think, is good Norman-French; and so, when the brute lives, and is in charge of a Saxon slave, she goes by her Saxon name, but becomes a Norman, and is called pork, when she is carried to the castle-hall to feast among the nobles. What dost thou think of this, friend Gurth, ha?"

"It is but too true doctrine, friend Wamba, however it got into thy fool's pate."

"Nay, I can tell you more," said Wamba, in the same tone. "There is old Alderman **Ox** continues to hold his Saxon epithet while he is under the charge of serfs and bondmen such as thou, but becomes **Beef,** a fierce French gallant, when he arrives before the worshipful jaws that are destined to consume him. Mynheer **Calf,** too, becomes Monsieur de **Veau** in the like manner; he is Saxon when he requires tendance, and takes a Norman name when he becomes matter of enjoyment."

"By S. Dunstan,"[2] answered Gurth, "thou speakest but sad truths. Little is left to us but the air we breathe, and that appears to have been reserved with much hesitation, solely for the purpose of enabling us to endure the tasks they lay upon our shoulders. The finest and fattest is for their board."

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[1] Swine, pl. of sow = sowen; cf. kine = cowen.

[2] Dunstan, Archbishop of Canterbury A.D. 958.

LESSON III.

COOKING MEAT.

DERIVATIONS.

Assimilated.—Made like. *Lat.* **sĭmĭlĭs**, like.
Culinary.—The art of cookery. *Lat.* **cŭlīna**, a kitchen.
Digestible.—That which may be dissolved in the stomach. *Lat.* **dĭgestĭo**, a dissolving of food.
Nourishment.—Support by food. *Lat.* **nutrĭo**, to nourish.
Scrupulously.—With a nice regard to minute particulars. *Lat.* **scrūpŭlōsus**, exact, precise.
Coagulate.—To curdle. *Lat.* **cŏăgŭlo**, to curdle.
Envelope.—To enclose. *Lat.* **involvo**, to roll to or upon anything.
Principal.—Chief. *Lat.* **princeps**, first in order.
Process.—Manner of accomplishing. *Lat.* **prōcēdo**, to go on.

PRONUNCIATION. Exercise on *A*, in
wall, fall, half, calf, walk, gate, gape, flay.

It is said that the French are the best cooks, because even the poorest women are able to make nice appetizing and nourishing dishes, by using scraps of materials which an Englishwoman would throw away.

To put aside as valueless any food that might be used is downright sinful *waste*, and you must remember the old proverb, "Wilful waste makes woful want." If we have more than we require for our own use, there are many who have not sufficient, and who will be only too thankful for some of our surplus.

To return to the subject of cooking. There is no just reason why the French people should surpass us in this important branch of domestic management. Every English girl ought to strive to the utmost of her ability, in order to become well informed in the art of cooking, and to remove the stigma which has been cast upon us. Whether she is to earn her living by cooking or not, does not matter.

First let us consider what is the object in cooking food. The wild animals eat all their food raw and unprepared. But domestic animals thrive best on carefully prepared food. A pig will eat raw potatoes; but it will fatten quicker on clean boiled ones. Why, then, do we spend valuable time and strength in the *culinary* art? Why, for the following among other reasons:—

Firstly. The appearance of raw meat is repulsive to our tastes.

Secondly. We have found that food in general is much improved in flavour by the various cooking processes; and,

Thirdly. Food substances are thus rendered more easily *digestible*, and consequently more valuable, as yielding a larger amount of *nourishment.*

The two great objects, then, of the cook are—First, to cook food so as to render the flavour of it pleasant; and second, to convert naturally tough, or indigestible, portions of animal or vegetable fibre into tender and easily *assimilated* material. The animal and vegetable kingdoms will furnish plentiful stores upon which to exercise her skill.

Some persons are of opinion that we should live entirely on vegetables and fruits, and are therefore termed **vegetarians.** But after all they cannot make their diet sufficiently strengthening, without a very liberal use of milk, which, you remember, is one of the most nourishing of the animal products. Milk is, perhaps, the only example of a perfect food substance. Most persons, however, prefer a due admixture of the two kinds of food; and so meat and vegetables form the principal part of our dinner, the chief meal of the day.

We will, therefore, consider how best **to cook and serve meat** of various kinds. Of course, we suppose that order and cleanliness reign in the kitchen, because these are requirements which can be obtained in the poorest household. It may cost a little extra time at first to cleanse *scrupulously* every utensil, such as saucepan, dish, plate, spoon, &c., but much valuable time and patience are thus saved in the long run.

You have read in your last lesson that the meat used in England is the flesh of the ox, sheep, calf, lamb, and pig. Joints from these animals are usually spoken of under the collective term of "butchers' meat," because we obtain them from those tradesmen who slaughter the animals and cut them into pieces suitable to the wants of families. Perhaps you will be amused to know that *a butcher* is called a *flesher* in Scotland. These joints may be dressed in various ways, according to the taste or means of the persons for whom the meat is intended. Thus the meat may be roasted, baked, boiled, or steamed. Experience has taught us that the **best parts are suitable for roasting,** such as the leg, loin, and shoulder of mutton; sirloin, ribs, and round of beef. The Sir Loin was knighted by Charles the Second, when in a merry mood, and seated before a fine joint of the Roast Beef of Old England.

Roasting.

When a joint is to be roasted we must be careful to have a *clear fire*, sufficiently large to last during the time the meat must remain in front of it; so that the process may be uniform throughout.

Now let us carefully consider the *process* of roasting. From your last lesson you have learnt that there is a certain proportion of albumen in the fibres of meat. You are best acquainted with this principle in the white of egg, and you know, too, that it is a semi-liquid in its raw state, but has the property of *coagulating* when subjected to heat. The fiercer the heat, the tougher and more indigestible the albumen becomes, and the less useful as food. Therefore we must be careful how we deal with the albuminous element in meat, or we may convert a useful into a useless constituent. The knowledge of its tendency to coagulate is a valuable aid to the cook, for it is her aim to prepare the meat so as to retain the juices. Here is the reason for the necessity of making a sort of sheath to bottle up, as it were, the juices securely. When a joint, then, is to be roasted, the correct method is to suspend it so that it may turn round close to the fire at first, but in about ten minutes, when the outside *envelope* has been formed, the joint must be moved back, in which position it may remain until cooked.

It is necessary that meat should turn regularly during the whole time that it is before the fire. For this purpose a simple little machine called a bottle-jack is commonly used; but an excellent substitute, and one frequently employed, is a hank of worsted and a screw hanger to fasten it on the mantelshelf. The great drawback to this last plan is, that it requires the cook to be constantly watching it, so as to be ready to give the worsted a turn when the revolving slackens.

Another necessity is, that all draught must be excluded from the meat. A screen is therefore required. In the houses of the rich, cupboard screens are sometimes adopted. They are lined with bright metal, and so reflect the heat and aid the action of the fire. They are usually fitted with shelves, too, for warming dishes and plates for the dishing up. A small clothes-horse placed in front of the fire, with household linen requiring to be aired, spread out upon it, will be found an effectual screen from the cold air and a good substitute for a more expensive one.

The fat of meat more readily catches the fire than the lean, and so it is wise to skewer a piece of fine white kitchen paper over any fat portions until the whole is about three-parts done.

Some parts of joints are better than others, e. g. the undercut of sirloin of beef is delicious, and superior in flavour and tenderness to the upper carving. A good cook is always particularly careful to preserve as much as possible the juices and flavours of the undercut, hence she never inserts the suspending hook so as to penetrate into these "prime" parts as they are called. While the joint is roasting, it should be constantly basted, i. e. have the gravy poured over it from a spoon, and about ten minutes before it is to be served, it should be well dredged with flour, so that the outside may appear of a dark, crisp brown.

A great deal of gravy and fat escapes from the meat during cooking, and more in roasting than in any other method. The gravy is usually served with the meat, and the dripping is most valuable for other cooking purposes, and when clarified it may be used with advantage in cakes and pastry.

Baking.

There is not quite so much waste in boiling and **baking** as in roasting. Thus it has been estimated that meat loses nearly 5½ ounces in the pound by roasting, about 4¼ by boiling; and 3½ by baking. But many people object to the peculiar odour and flavour of baked meat. The vapours arising during the process are partly burnt on the heated sides and roof of the oven, and partly reabsorbed by the joint, which becomes sodden and consequently less delicate to the taste. This objection has been removed in some degree, however, by the use of ventilators in the oven door. Baked meat is generally palatable, and when a Yorkshire pudding or potatoes are cooked under it, especially so.

Boiling.

In **boiling,** as in roasting, an outer coat must be formed by coagulating the external albumen. The plunge into boiling hot water (212° Fahrenheit) is sufficient for the purpose, and then the next consideration is how to keep the meat juicy and tender. Experienced cooks are of opinion, that the right heat for this object is from 180° to 200° Fahrenheit. If you do not possess a cooking thermometer, you may readily judge the heat required by removing the saucepan to the side of the fire, and observing if the water **simmers the whole time.** The lid of the saucepan must be removed only when the scum has risen to the surface, which it will do during the early part of the process. Unless this scum be removed, the flakes settle on the top and cause the meat to look unsightly when served. Salted and smoked meats, such as ham and tongue, require soaking for some hours in cold water before being boiled, to remove some of the salt and soften the fibres.

The best plan of cooking such meats is by **steaming** them in the same way as potatoes are sometimes steamed.

It is a vulgar prejudice that there is no joint worth eating but sirloin or ribs of beef, and leg of mutton. Aitch-bone or brisket of beef, and neck of mutton, are cheaper than the best joints, and contain quite as much nourishing matter.

Stewing.

Other parts, as flank or skirt of beef, and trimmings of the best joints of both mutton and beef, are valuable for serving in **stews**, e. g. Irish stew, in beef *à la mode*, or in what are usually termed **made-dishes**, that is, meat cooked with vegetables and seasoning, or with curry powder. That the cooking process be very gradually conducted is a most essential point with such meat, and on no account must the gravy ever *boil*.

A gentle simmering is the only means of obtaining a tender stew.

If the fibres be a little tough, as sometimes happens in hot weather, because the butchers cannot hang the meat long, a few drops of vinegar sprinkled on each piece of meat before putting it into the stewpan will loosen the fibres and make it tender.

"Cooking Pot."

One of the best novelties in the cooking world is Captain Warren's **Everybody's cooking pot,** which contains an inner cylinder with an air-tight lid. Between the outer and inner saucepans water is kept boiling, and the meat and vegetables or whatever else is to be cooked are enclosed in the air-tight compartment in the middle; thus they do not come into contact with either water or steam. The great value of this invention is that the heat never can grow excessive, because the inner saucepan can never exceed the heat at which the water boils in the first. The great advantage of the cooking pot is, that *all* the valuable parts of the meat are preserved.

If there were only space, very much more might be said about cooking; but it will be well if you think about, and whenever you have a chance, put into practice, some of the hints contained in this lesson; which does not pretend to make you perfect cooks, but only attempts to teach you some facts which every girl ought to know.

LESSON IV.

MILK AND ITS USES. TOWN AND COUNTRY MILK.

DERIVATIONS.

Constituents.—Different parts or things put together to make a whole. *Lat.* **constituo**, to place together.

Illusion.—Something that deceives the sight by a false appearance *Lat.* **in**, upon, and **ludo**, to play.

Myriads.—*Gr.* **myrias** = 10,000; an immense number, too many to count.

Supersede.—To take the place of something else. *Lat.* **super**, above, and **sedeo**, to sit.

Decompose.—To separate things that were once placed together. *Lat.* **de**, apart from, and **compositum**, placed together.

Ferments.—A peculiar change which some substances undergo to produce vinegar, or acid, or spirit. *Lat.* **fermentum**, that which causes fermentation.

Coagulate.—A driving of particles together till they form a thick jelly-like mass. *Lat.* **coāgūlo**, to curdle.

Adulterated.—Changed or mixed to an inferior condition. *Lat.* **adultero**, to debase or corrupt.

PRONUNCIATION. Exercise on *O*, in

old, to hold, sold, to fold, cold, told, bold.

Everybody has seen and tasted milk, but perhaps comparatively few persons know accurately how very valuable it is as food. Milk is one of the most perfect articles of diet with which we are acquainted, for it contains in rich abundance, and in the right proportions, all the materials necessary for the formation as well as for the repair, of every part of our bodies, flesh, bones, and blood; besides yielding other substances of minor importance, such as a peculiar sugar, a small quantity of salts, and an acid.

Milk is essential, not only to our health but to our very lives in infancy, and it is a most desirable food for us in our maturer years.

Some clever doctors say, that all grown-up people, as well as children, would be stronger and healthier than they are, if they took a quart of milk daily.

It digests in two hours, while most other food requires four or five; and so easily, that it is adapted equally for the young as for the old. Hence, milk taken with porridge by the labouring man, or with soaked bread by the little child, is more nourishing and fattening for breakfast and supper than any other food would be. We generally use the milk of the cow, but in some countries that of the goat, ass, sheep, camel, and bison, is largely taken. Even in England the milk of the donkey and goat is sometimes recommended for invalids and infants.

All kinds of milk have the same *constituents*, though the relative proportions differ in each kind, according to the animal which yields it. Perhaps it is only prejudice in favour of what we have been accustomed to, but in our opinion milk from the cow is without a rival; and we should miss it very much indeed, if we were deprived of it. Doubtless some of you have watched the cows being milked in the morning, or in the evening, and have enjoyed a good draught of the sweet fresh milk. If you were asked to describe milk, you would most likely say that it is a white opaque fluid, with a faint, peculiar, though agreeable odour.

But this whiteness is an *illusion*, for if you were to examine some milk under a microscope, you would find that it is really a transparent fluid, with *myriads* of tiny balls of fat floating in it, each enveloped in a little case of thin skin. You will hear more about these presently.

But the milk must be carried home to the dairy with great care, for it will spoil it to shake it about much. It should be strained and then gently poured into shallow pans and set in a cool place.

If left undisturbed for a few hours, varying with the atmospheric temperature and the season—about eight or ten in summer, but twelve or more in winter—you will find that the little roundish bags of fat have all risen to the top, and now form what we call **cream.** We put the milk into shallow pans, because by increasing the surface and diminishing the depth, we assist the rising of the cream, which takes place more readily and in greater abundance, than when the light globules have to make their way through a considerable depth of milk. The exact quantity of cream thrown up by the milk in twenty-four hours can be ascertained by the use of a simple instrument, consisting of an upright glass tube and termed a lactometer or milk-measurer. If our milk be of good quality the cream will average from $\frac{1}{10}$ to $\frac{1}{8}$ of its bulk. Some cows, as, for example, the Alderney, yield much richer milk than others; but the relative quantity of cream varies not only in the several breeds, but even in the same cow under different conditions of food and warmth.

The pastures of the lowlands produce far richer milk than those of upland districts. But it is best of all in the spring time, when there is abundance of fresh, green herbage. Some persons assert that stall-fed cows and those kept in towns give superior milk.

If this be true, it must be due rather to the excellence of the cow, than to its comparatively unhealthy conditions of feeding. When a cow has been driven for a long distance, or has not been sufficiently protected from cold, the milk is always inferior.

You may be aware that the morning's milk from all cows is thinner than the evening's, and that the last drops from the udder are invariably the richest. The **dairy**, as the store-room for milk is called, should be very cool and spotlessly clean, otherwise it is impossible to keep the milk sweet. Perhaps some of you have visited a model dairy, and noticed the white or pale porcelain tiles with which the walls are covered to half their height, and which give such a clean, bright appearance to the whole.

You may also have observed that wooden pails for milking, and earthenware pans for the milk, now generally *supersede* the old-fashioned metal ones. This is an excellent modern improvement, for milk should never be kept in zinc or copper vessels, because it has the power of dissolving small particles of these metals, and thus rendering itself poisonous. It is also most important that everything belonging to a dairy should be thoroughly cleansed with absolutely pure water; for fevers have been communicated by the use of milk from vessels washed with water from impure wells.

All pans, jugs, &c., ought to be well scalded before the milk is put into them. Still, in spite of the utmost care, milk soon turns sour in warm but especially in thundery or close weather, or if long exposed to air at ordinary temperatures. Milk turns sour because its **casein** (as the **curd** is called in scientific language) combines with oxygen taken from the air, *decomposes*, *ferments*, and forms **lactic acid**, a colourless syrupy liquid which dissolves in cold milk, but *coagulates* on the application of heat.

This explains a common experience in cooking, of apparently sweet milk curdling at once when it is boiled, or even when poured into very hot tea or coffee. But milk may be kept sweet for a few hours, at least, in summer by immersing the jug containing it in very cold water; or by putting a pinch of bicarbonate of soda into it.

Another good (perhaps the best) plan is to scald it, that is, to heat it through over a stove, without allowing it to boil; but it must be set in a cool place afterwards, and be left in the pan in which it was scalded until it is required for use. Thus prepared, the milk will keep for twenty-four hours, and for double that time if a little sugar be added during the process. Some good housewives say, that a table-spoonful of finely shred horse-radish put into a moderate-sized pan of milk, will keep it fresh for several days, even in hot weather.

Milk is very valuable to us as food when we are in health, but still more so when we are ill, especially if we suffer from delicacy of the chest. Consumptive patients take large quantities of milk with great benefit to themselves. If they fancy it too heavy for them when it is cold, it is equally good and certainly lighter or easier to digest if taken warm.

Cream also is now frequently ordered to invalids as a nourishing and most agreeable medicine, and is in some respects a substitute for cod-liver oil.

But you will learn more about the uses of cream in the lesson on butter and cheese.

Asses' milk also is highly beneficial for sick persons. Its great virtue lies in the fact that it contains more **sugar of milk** and less casein. It is not so rich as cows' milk, and can therefore be more readily digested by delicate stomachs. Unfortunately it is too expensive in England for poor people, as it is often as much as 6*s.* per quart.

When the cream has been removed from the surface the fluid left is called **skim-milk.** This is nearly as nourishing as new milk, and is much cheaper. Cooked with rice or with oatmeal, skim-milk is very valuable, because the rice or oatmeal supplies the deficiencies in the milk due to the loss of most of its cream or fatty portion.

No doubt you would all like to know how to prepare **Devonshire or clotted cream.** This is how it is managed.

When the milk is brought in, it must be carefully strained to free it from little bits of dirt, straw, or anything that may have accidentally dropped into the pail during milking. Next it should be poured gently into a metal pan, and allowed to stand in the dairy for twelve hours in summer and twenty-four in winter. The pan should then be set over a slow fire, and allowed to remain there until we can see the shape of the bottom of the pan in the cream. This tells us that the milk is sufficiently scalded, and we must take the pan off the fire at once, or there will be great risk of failure, and set it in the dairy, but we must not skim the milk until the next day.

This cream, which is termed "clotted" from its appearance, is very highly esteemed, and is especially delicious eaten with fresh fruit. It is sent up to the London markets in small, square tins, and probably many of you have tasted it.

Formerly wicked and fraudulent dealers, especially in the metropolis and other large towns, shamefully *adulterated* the milk, by putting into it all sorts of injurious substances; consequently town milk was greatly inferior to country milk. But many of them have been detected, and their dishonest practices severely punished by heavy fines, as they deserve to be. So there is little adulteration in milk now.

Therefore, though we may have to pay a little dearer for it, we can get it fairly rich and good from town as well as from country dairies. Besides, dairy-keepers who are anxious to serve their customers well, either have farms of their own in the country, or arrange with some farmers, on whom they can depend, to supply them daily with milk.

You may have seen the large, upright cans in which the milk is conveyed, taken out of or put into the train sometimes when you have been travelling. Within the last few years persons have become more alive to the extreme value of milk as food, and so they have tried by various processes to preserve it in such a way that it can travel long distances without injury; and so be sent to the less abundantly supplied districts.

Methods of Preserving Milk.

One plan is to place bottles of milk up to the neck in a saucepanful of water, which is then gradually heated and allowed to boil for a quarter of an hour. The bottles are then taken out of the water, and closed with tight-fitting corks so as to exclude the oxygen of the air, which, you remember, we said would decompose the milk. But this milk will keep good only about twelve months.

A more successful process is accomplished by evaporation, which reduces the milk to about one-eighth of its original bulk. And I am sure you have all often seen the hermetically sealed cases of condensed milk, as it is called, which are sold by every grocer and at all co-operative stores, and which will keep good for years. Some of it comes from America, and some from Switzerland, and other countries.

Before closing this lesson, I want just to tell you also that milk puddings, being so much lighter than any other, are the very best for invalids, because they are nourishing and easily digested. It is a mistake to think that eggs are necessary to make such puddings good; they add, indeed, to the richness, which will probably make them disagree with an invalid.

LESSON V.

BUTTER AND CHEESE.

DERIVATIONS.

Perforated.—Pierced through. *Lat.* **perfŏro**, to bore through.
Axis.—That round which anything rolls. *Lat.* **axis**.
Uniform.—Even, not variable. *Lat.* **ūnĭ-formis**, in the same manner.
Manipulation.—Working by hand. *Lat.* **mănĭpŭlus**, a handful.
Saturated.—Filled to excess. *Lat.* **sătŭro**, to fill.
Expedient.—Serving a purpose. *Lat.* **expĕdĭo**, to bring to pass.
Extracted.—Drawn out. *Lat.* **ex**, out, and **trăho**, to draw.
Solidified.—Made firm. *Lat.* **sŏlĭdus**, dense.
Rancid.—Rank, sour. *Lat.* **rancens**, stinking, putrid.

PRONUNCIATION. Exercise on *EI* (*EY*).

aye, they, nay, their, hail! raise, a rein, swain, steak, weak, to bait, to die.

Butter.

You all know how necessary it is to take some fat or oily food, to keep up the proper warmth of our bodies.

Various substances would serve this purpose, but the favourite body-warming food with English people is butter; because they like its delicate flavour, and they have every facility for an abundant supply. Italians prefer olive oil; Esquimaux, whales' blubber.

Butter is one of the lightest and most easily digested kinds of fat. It contributes largely to form the bile; and it serves as fuel to be burnt up in the process of respiration.

In Lesson IV. you were told that the cream which rises to the surface of milk, after it has stood for twelve hours or more, consists of numberless tiny globules of fat, each encased in a filmy skin. These are really minute butter-balls, and their abundance is one test of the quality of milk. When the cream is shaken the tiny envelopes break, and discharge their contents, which combined form butter.

This sounds as if butter-making were a very easy matter; but it is really a delicate process, demanding extreme cleanliness and close attention, with much forethought and skill. So we had better take a glance at the dairy, and see if all be right there, for otherwise failure must attend our efforts if we have to make butter.

The dairy must be cool and spotless, a pleasant place to visit at all times. In summer we may keep it at the right temperature by constantly sprinkling the floor with cold water, or by suspending wet cloths inside the window blinds and in various other parts of it. But it usually has a north aspect, and is partly underground, so it may not require them. Again, when the winter cold is excessive the air may be warmed to the required degree by the use of a little stove.

If the milk be kept too warm it will turn sour, and if too cold, the cream will not rise properly.

Until lately most dairies were fitted with shelves of marble or slate, on which the milk-pans rested; but now it is considered better to have for that purpose a large stone table in the centre of the dairy, furnished with a water-tight ledge, within which water may remain in hot weather.

In addition to our milking-pails, milk-pans, horsehair sieves for straining, and tin slices, or cream-dishes, for skimming the milk, we shall require a butter-tub and scales and weights; and all these should be well washed and scalded in strong soda water before and after every time of using.

The process by which cream is made into butter is known as **churning**, and the machine employed is called a **churn**. This is a square or cylindrical box, furnished either with a single *perforated* wooden beater, Fig. 2, which is worked up and down; or with several

FIG. 1.

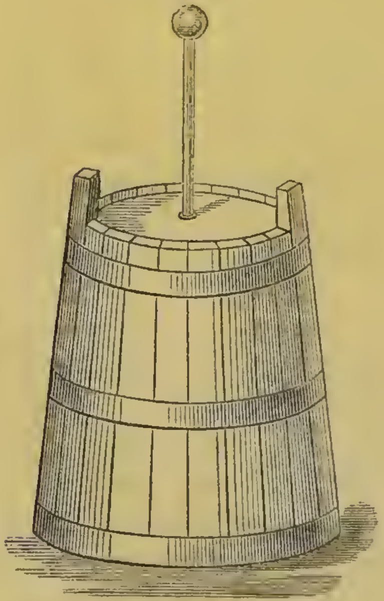


FIG. 2.

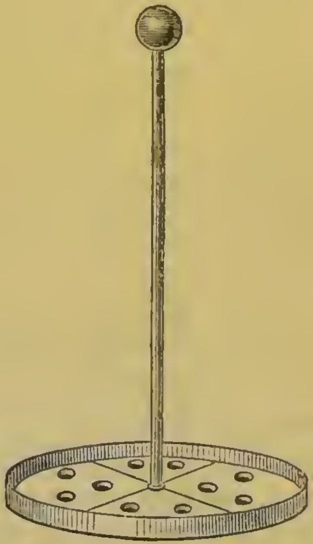


Fig 3

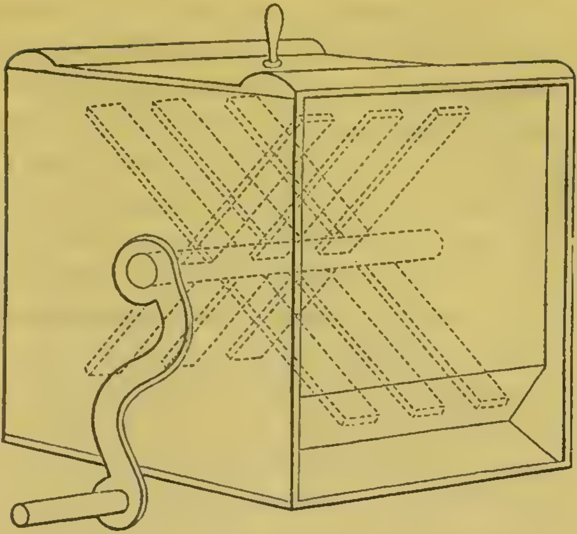
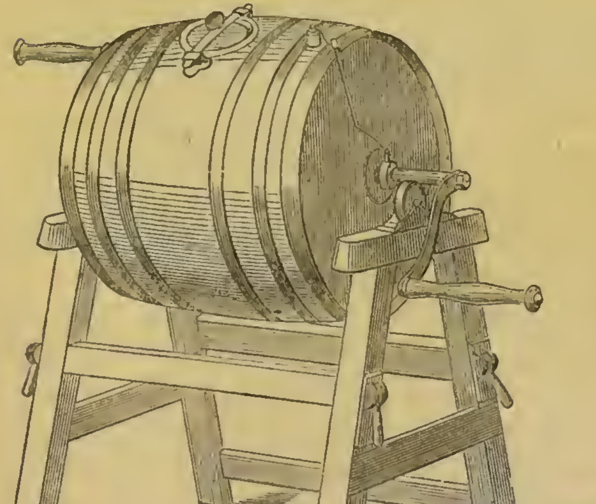


Fig. 4.



beaters radiating from a common *axis*, like the spokes of a cart wheel, and turned round and round by a handle.

But this is a very broad and general description, for churns vary greatly, both in shape and in size.

The two churns most commonly used, however, are the **barrel** (Fig. 4) and the **plunge** (Fig. 1), and of these the last named is generally preferred, because, though the barrel is the more easily worked, the plunge extracts the butter more thoroughly. For family use, an American novelty, called the **atmospheric** churn (Fig. 3), is now strongly recommended. It causes the air at a certain temperature to act upon the cream so rapidly and effectively that it can make 5½ lb. of butter from five quarts of cream in eight minutes. This churn is inexpensive, does not easily get out of order, and makes excellent butter, which is said to keep good longer than any other.

The process of butter-making is much the same whatever churn is used. The cream as it is skimmed from the milk day by day is stored in an earthenware jar. When a sufficient quantity is collected, it must be put into a churn, and agitated for a longer or shorter time, varying from a few minutes to an hour or more according to the season. Something is wrong if the butter is more than an hour "coming."

But we must be careful to keep the cream at a temperature of about 60° Fahrenheit all the while, or we shall not have good butter. When the cream is too warm it froths, and sometimes in hot weather it becomes very thick, which makes the churning difficult. We should add a little water to it in this case. We must churn with a regular and *uniform* motion, and not very quickly, or too much air will be forced into the cream, which will then heave and swell, and the butter yielded will be pale in colour, soft, and inferior. When the butter has "come" it forms a solid mass at the bottom of the churn, and is surrounded by **butter-milk**, as the remaining liquid is called. If thus left, it would not keep, because the buttermilk contains lactic acid, which, you remember, turns milk sour. The casein, too, would begin to putrefy, and would soon infect both the sugar and the oily matter, and the butter would go *rancid.*

The butter must therefore be lifted out of the churn into a butter-tub, full of pure spring water, to which a little salt has been added, and then be thoroughly washed and kneaded to free it from the buttermilk, the water being poured off and renewed until it comes away quite clear.

Nothing tests a dairymaid's skill more than this operation, for imperfect washing is the cause of a great deal of bad butter, as you can now understand. The successful *manipulation* of butter is a delicate matter, and no one who has not a clean, cool hand, should touch it, or she will spoil it at once.

In England buttermilk is usually given to the pigs, but in many agricultural districts of Scotland and Ireland it forms an important article of diet. Obtained from fresh cream, it is nourishing and easily digested; but as it has lost most of its heat-giving material, it is generally taken with oatmeal or potatoes. When quite fresh it is very pleasant drink in hot weather.

Devonshire butter is prepared from the clotted cream in a few minutes in small households, by working the cream round and round in an earthenware pan by a uniform motion of the hand, always in the same direction. But if very large quantities are required it is churned. Butter comes quicker and in greater abundance from scalded than from unscalded cream, but it will not keep good so long.

The butter is weighed and made into **rolls** or **pats**, weighing a pound, a half, or a quarter of a pound, and stamped with various pretty impressions, ready for home consumption or for the market. In Cambridgeshire it is made into long rolls and passed through a ring for convenience of division, and so it is said to be sold by the yard in that county.

Butter is sold as **fresh, potted,** and **salt.**

Fresh Butter.

This, when made from spring and summer pastures at least, is of a bright golden colour, has a delicate, agreeable flavour, requires very little salt, and is free from moisture. But in winter, when the cows are stall-fed, the butter is often pale and tallowy-looking, and as most persons prefer a deeper hue, it is obtained by putting a little finely powdered **annotta,** or a small quantity of carrot juice into the cream before churning.

You know that fresh butter sometimes looks soft and *unpresentable* in hot weather. But this can easily be avoided by keeping the butter-dish surrounded with ice or cold water, or by using the simplo and valuable contrivance of turning over it a clean flower-pot swathed in flannel, which is kept constantly *saturated* with water. The hole in the top serves for ventilation.

Potted Butter.

But we should always **pot** some summer butter for winter use. It is easily done, and we thus make sure of a good supply. For this purpose, perhaps the Nottingham stoneware jars, with lids, are best. First a layer of finely-crushed salt should be put into the bottom of the jar, and the butter then closely pressed and beaten down in it with a wooden rammer. When the jar is quite full salt should be well sprinkled over the top, the whole covered with the lid, and stored away in a cool place.

Salt Butter.

When butter is mixed with larger quantities of salt, in order to preserve it a long time, we obtain what is called salt, tub, or shop butter, which is lower priced, and is generally considered inferior to fresh.

But for culinary purposes, and especially for pastry, **clarified** butter is generally preferred, though the preparation deprives it of some of its flavour. The butter is very gradually heated until the water in it evaporates, and the curd falls to the bottom. The clear butter is then poured off and tied down with bladder to exclude the air, and when cool is ready for use. Although we make immense quantities of butter in our own country, the supply does not nearly equal the demand for home consumption. So every year we import at least 6,000,000*l.* worth from foreign lands. Much of it comes from Holland, France, Ireland, and the Channel Islands, but we have a great deal also from British North America, the United States, and elsewhere.

Dutch and Normandy butters are very highly esteemed.

But all sorts of wicked frauds are practised to adulterate butter, and to deceive people, especially poor people. Dealers sometimes wash and repack inferior Irish butter, and sell it as the produce of Cambridge and Devon. This is cheating.

Some persons mix an undue proportion of water and salt with high-priced varieties to make them weigh heavier; and tallow, lard, and horse grease with cheap, rancid butter. This is worse than stealing.

But we can find out whether it has been adulterated with tallow or lard by melting a little butter, and then smelling it. If lard be present, the butter will look streaky. Other objectionable substances with which butter is often adulterated are not so easily discovered.

American ingenuity, however, has furnished us with another novelty, which might not commend itself to our tastes if we knew what we were eating. But it is nevertheless publicly manufactured and largely sold in England, France, and Germany, though the inventors are too wise to eat it themselves.

It is known as **butterine** in our country, and is preferred to butter by some cooks.

It is made from the little yellow globules extracted from the fat of newly slaughtered animals. So great is the demand that a prosperous trade in it has sprung up in New York, and the supply is not yet sufficient, though even now 1,000,000 lb. are exported thence every month.

But it is a pity to resort to such *expedients*, for when butter is high priced it is not economical, and might easily be dispensed with, and dripping from roast meat substituted. Good dripping at 6*d*. per lb. is better than inferior or bad butter at 1*s*., both in flavour and as a heat-giver. At these prices the dripping would yield 886 grains of carbon for a penny, while the butter would afford only 382 grains of that substance for the same money. Bread and good dripping is far better than bread and bad butter.

Cheese.

Cheese is another valuable product of the dairy. It is the coagulated casein or curd of milk, pressed, salted, and dried; and it is nourishing in proportion to the relative amount of butter retained in it. Hence, the several varieties of cheese are grouped according to the quantity of cream used in their manufacture.

The richest are the **Stilton** and **Lincoln**, made from **new milk**, with occasionally some additional cream. Next in quality are those from new milk alone, as the **Cheddar** and the **double Gloucester.** The highly esteemed **Cheshire** cheeses rank next. They are the produce of milk from which part of the cream has been abstracted, for as they are often large and heavy, some of them weighing 120 lb. each, they would be too rich to hold together, and would crumble if all the cream were left in.

The **single Gloucester** cheese is obtained from a mixture of equal quantities of new and skim milk.

Many **Dutch** cheeses, and some from **Friesland,** are made from skim-milk alone. You know the red-looking cannon-balls, don't you? Possibly you have seen that hard and tasteless variety called **Suffolk bank,** or **Suffolk whang,** which is obtained from milk that has been skimmed three or four days successively, and has therefore scarcely a particle of fat left in it.

Some dishonest cheese-dealers place a piece of good cheese with a borer into a bad one, and give this as a specimen to an unwary purchaser to be tasted. So if you buy a cheese see that you taste it, and not another.

For cheese-making it is necessary first to curdle the milk, that is, to cause the **curd** and the butter together to separate in a solid mass from the **whey,** or watery portion which contains the sugar of milk. We know very well that milk left to itself will sooner or later turn sour, and this separation takes place, but for cheese the curdling must be artificially and quickly produced by some acid. In different countries different substances, such as lemon-juice, vinegar, or cream of tartar, are employed for this purpose, but we use **rennet,** which is the gastric juice of the salted and dried stomach of a sucking calf.

A small piece should be soaked in water, and the infusion poured into milk at a temperature of 90° or 95° Fahr., and it will soon curdle.

Most persons say that rennet is really not fit for use until it is about twelve months old, for the decay of part of the membrane renders it soluble in water; and it then more readily changes the sugar of milk into lactic acid, which causes the milk to curdle.

The curd is firm and solid, and must be cut or broken to allow the whey to flow freely, which must be skimmed off as it arises, and the curd next lifted into a sieve and allowed to drain awhile. Then it should be put into a *vat* or *mould* with perforated sides and bottom, through which the whey can escape, and afterwards be subjected to gradual pressure, either in a screw **cheese-press** or under heavy weights. At intervals the curd must be taken out, salted, and replaced, until every drop of whey has been extracted, or else the cheeses will not keep.

When partially dry, the cheeses are removed to a clean, cool, well-ventilated room to *mature.* Here they should be turned two or three times a week, and wiped with a dry cloth to remove any moisture that may *exude.*

The **rind** is sometimes formed by wrapping cloths dipped in boiling water round the cheeses, which process hardens the outside.

Some cheeses ripen in a few months, but others are not fit for sale in less than two or three years. Now cheese, as a rule, is tough and indigestible, with the exception of what we call **cream cheese,** which is only cream *solidified* by the use of rennet, and must be eaten while quite fresh, as it soon becomes bad.

Well-made cheeses will keep for years, but they must be constantly examined to see that the rind does not crack, so as to admit the air, or they will rapidly decay.

Cheese, like butter, is coloured with a little annotta, or yellow carrot juice.

But cheese is neither cheap nor very digestible, and therefore ought not to be taken in large quantities especially where meat can be obtained. In South Wales and Wiltshire it is regarded as a necessary article of diet, for the people are sometimes too poor to buy much meat. Of course, under these circumstances only the inferior kinds of cheese are used, which contain but little heat-giving or nutritive matter.

In England and elsewhere, cheese is now taken in small quantities after dinner, as a relish or digester of other food. All varieties are, however, not equally valuable for this purpose. The older and partially decayed cheeses are considered best. Bread and cheese is a favourite English food.

If a small quantity be introduced into the stomach, it gradually causes some chemical changes among the particles of the food which has been previously taken, and helps to dissolve them, and prepare them for digestion. But you must not think that the mere eating of a morsel of cheese after dinner necessarily promotes digestion.

New and inferior cheese will only add to the quantity of food, and will have to be itself digested by the ordinary process.

Besides all the cheese that we make at home, we receive a great deal from various parts of the Continent and from America. During the year ending September 1877 we imported 218,569 cwt. of cheese, worth 619,006*l.*

Early in 1878, a steamship from New York touched at Southampton on its way to London, bringing no less than 50,000 boxes of cheese, besides large supplies of other provisions. American cheeses mostly have calico round them.

LESSON VI.

FISH, AND HOW TO KNOW WHEN IT IS FRESH.

DERIVATIONS.

Subsisted.—Lived. *Lat.* **sub-sisto,** to stand firm.
Communication. — Mutual intercourse. *Lat.* **com-mūnis,** general.
Exclusive.—Separate, debarred from common use. *Lat.* **excludo,** to shut out.
Scavengers.—Those who clear away filth. *Ger.* **schaben,** to scrape.
Edible.—That may be eaten. *Lat.* **ĕdo,** to eat.
Consumption.—The act of consuming for food. *Lat.* **con-sūmo,** to devour.
Staple.—Regular, chief. *Lat.* **stăbĭlĭo,** to establish.
Popular.—Pleasing to the people. *Lat.* **pŏpulus,** the people.
Tainted.—Spoilt by commencing decomposition. *Lat.* **tingo,** to stain.
Opaque.—Dense, not transparent. *Lat.* **ŏpācus,** shady.
Semi-transparent. Partly transparent. *Lat.* **semi,** half, **transpĭcĭo,** to see partially through.

PRONUNCIATION.

so, woe, who, no, go, toe, two, ought, not, whole, hale, holiday, mole.

In early times the Britons subsisted chiefly upon the products of the chase and fishing. Those who dwelt near the sea, and on the banks of rivers, lived almost entirely upon fish; while those who lived inland perhaps seldom saw such a dainty. Now, thanks to railroads, communication between all parts of the country is so rapid and perfect that a perishable article like fish may be bought almost as cheaply in the large towns of the interior as on the sea-coast; and in London even more so.

Numerous varieties of fish are sold in our markets, and they form an important article of diet. They are valuable because they contain much nourishment, and at the same time form an agreeable change of food.

Fish, as a rule, with the exception of lobsters, crabs, and other shellfish, is more easily digested than flesh; particularly by those who do not take much exercise, or those who do brain work. Its exclusive use, however, would not be good.

The flesh of fish contains the same amount of nitrogen as that of the herbivorous animals; but the constituents, and consequently the nutritive value, vary with the kind.

The muscular flesh differs not only in the varieties of fish, but also in the same fish at different times of the year. The quantity of **fat or oil** present in it, affects the flavour, and also the digestibility of the fish.

Fishes are said to be "out of season," or "foul," after spawning or laying their eggs, because then the flesh is watery and unpleasant to the taste, nay sometimes positively injurious.

If you be anxious to excel in the art of preparing and cooking food, as you ought; you must try to become acquainted with the seasonable times for certain fish, so that you may purchase well and wisely.

Those kinds are most easily assimilated which contain least oil. Of these, **whiting,** which has been called "the chicken of the sea," on account of its white and delicate flesh, ranks first; and the **sole** and **plaice** are other members of the same class. Nicely cooked, these are, therefore, best adapted to the requirements of an invalid, and are frequently ordered by medical men.

Those containing much fat are the **eel, salmon, cod, herring, pilchard,** and **sprat**; some of which store up most oil in the liver, as the cod, pilchard, and sprat. The "thin part" of the salmon, being the richest, is usually considered a great delicacy. But salmon is, as a rule, too dear for poor people to buy.

One reason why fish is said to be less nourishing than flesh, is because the flavouring matters peculiar to the juices of meat are absent. The substance thereby loses some of the stimulating properties required to provoke and sustain appetite.

Among shellfish, **crabs** and **lobsters** are never very easily digested, and often disagree with people. They are exceedingly coarse feeders, and act almost as scavengers of the sea, which may perhaps partly explain the matter.

Oysters, if taken raw, are good, but they become tough and hard by stewing, owing to the coagulation of the albumen contained in them. In a general way, oysters are too dear to be thought of, either raw or cooked.

Mussels are frequently exceedingly unwholesome; but for the sake of those who care for them, we will say that before they are eaten they should be thoroughly cleansed, and the beard carefully removed. **Cockles,** so abundantly taken on some parts of the English coasts, are eaten either raw or cooked, and are prized by both rich and poor. **Limpets** are tough but nutritious morsels; they are, however, rather neglected as food. Possibly some of you may have amused yourselves by detaching limpets from the rocks, but it is great and wanton cruelty, unless you want them for food. You are compelled to use a good strong knife to get them off, for they cling very tightly. **Periwinkles,** or "pin-patches," as the Suffolk folk call them, are by no means to be despised where they are obtainable.

The consumption of fish in the metropolis is very considerable, and you must all have heard of Billingsgate, the great fish-market, not far from London Bridge. Here fish is received from all parts by train, and fishing smacks sail up the mouth of the Thames to deposit their contents at the market wharf.

It will be interesting to consider with some detail the chief kinds of fish used in our country, in what parts of the year they are in perfection, and the methods employed for preserving them.

Herrings are the most important of our British fish, and are in season between the months of July and November. The chief fisheries are carried on at Galway and in the æstuary of the Shannon, in Ireland; Cardigan Bay, in Wales; Yarmouth, Lowestoft, Hastings, in England; Aberdeen and Wick, in Scotland. This last is specially noted among tho Great Britain fishing stations. The **pilchard** is caught almost entirely off the coast of Cornwall during the summer. The **sardine,** which belongs to the same class, is caught in the Baltic, the Atlantic, and tho Mediterranean. It remains in the depths of the sea during the winter, but about the month of June shoals appear near the surface, and numbers are taken by means of nets. The flesh, both of pilchards and sardines, is very delicate, and they are highly esteemed. Along the French coast between the Loire and Brittany, many establishments are engaged in preparing and preserving in oil these little inhabitants of the waters for export.

The **sprat** affords a very abundant and agreeable supply of cheap, wholesome food. It is caught during the winter months chiefly off the coasts of Kent, Essex, and Suffolk. It was an ancient custom that the first dish of sprats in the season should grace the banquet-table of the Lord Mayor, on the 9th of November.

The common **mackerel** is very valuable, and is brought to land in immense quantities. It soon dies when taken out of water, and will not keep long, but readily taints. It ought, therefore, to be purchased very fresh. Off the western coast of England the fishermen capture mackerel in nets by torchlight. It would seem that about seventy-five years ago, mackerel was regarded as a rare dainty and commanded high prices in London, for the Annual Register of Trade for April 11, 1803, states, "For the first time this season nine mackerel were brought to the beach at Brighton, and they were immediately purchased for the London market at 6*s*. 6*d*. each. On the following day another boat arrived with twenty-eight more, which were bought with equal avidity at the same price." This is very different from the numbers obtained and the prices paid for them now. In the season they form almost a staple food to many, and may be purchased sometimes for as little as 1*d*. or 2*d*. each. "*Six a shilling—mack'rel*"—is a well-known street cry.

There are two mackerel seasons: one in the spring, the other in the autumn. The early one gives generally the larger yield, but the autumn mackerel are finer and in better condition. Only a few years ago popular prejudice was so strong against the late mackerel, that they were but scantily fished; and the costermongers used to call them "heart-breakers," because no one would buy them. But persons have learnt by experience that some grandmother's tales are not to be believed, and there is now a great demand for the fish in either season. You may like to know that mackerel (French, *maquereau*) are so called because they are spotted. The Latin for spot is *macula.*

Cod is a valuable fish, and very abundant in the Atlantic Ocean. It is taken in great numbers off the coast of Western Europe, especially near Scandinavia, and also near the shores of North America, where the chief fishing stations are in Newfoundland and Labrador. The Newfoundland bank is the largest cod-fishing station in the world. The chief occupations of the people of Newfoundland are in connexion with the cod fishery. From thence the salted fish, packed in barrels, are exported to England and the countries of South Europe during the season of Lent. The London markets are supplied with fresh cod chiefly from the North Sea fisheries, over the Dogger Bank, and off the coasts of Norfolk and Lincolnshire. The Orkney and Shetland Islands, north of Scotland, are also favourably situated for carrying on the same fishery. The fish are in season from October to Christmas.

Salmon fishing forms a very important branch of industry in many countries. The fish are usually captured as they ascend the rivers for the purpose of spawning; after depositing their eggs they are very lean, and the flesh is of little value.

The London markets are mainly supplied from the Tweed and other Scotch rivers, and the Norway and Dutch fisheries. Salmon is in season during the summer, but, as we have said, is usually very dear. **Turbot** is taken in small numbers off all our coasts, but the chief supplies are brought by the Dutch vessels. Turbot is usually a shilling or more a pound, and is esteemed next after salmon. **Sole, plaice, flounders,** and **dabs** are other flat fish in great request in our markets, and of these, soles are the dearest.

Fish cannot be obtained too fresh; it is injurious if but slightly tainted. So be careful in choosing fish to notice these two things. First, **the eyes and gills should be bright.** Second, **the flesh ought to be stiff and firm.**

After it is cooked, the flakiness and opaque appearance of the muscle may be taken as an indication of good quality; while a semi-transparent or bluish appearance, after sufficient cooking, is usually a sign that the fish is out of season and of inferior value. A layer of white curdy matter between the flakes is always considered to show excellence of quality.

It will be well to remember that **boiling** is the most wholesome way of cooking fish. **Frying** renders it more indigestible than any other method. Persons of delicate stomach should never eat the skin of fried fish, and they should avoid smoked or pickled fish.

The kinds of fish most easily preserved are those firm in texture and rich in oil. The chief methods adopted are: **salting and drying,** as in the case of haddocks; **salting and smoking,** as for whole bloaters, and kippers which are herrings split open and cleaned before curing, and for salmon; **salting,** as for cod; and **preservation in oil,** as for sardines, Cornish pilchards, and Labrador salmon.

LESSON VII.

FRESH VEGETABLES: HOW TO SELECT, PREPARE, AND COOK THEM.

DERIVATIONS.

Esculent.—Eatable. *Lat.* **escŭlentus,** good to eat.
Insipid.—Without flavour. *Lat.* **insĭpĭdus,** tasteless.
Dissipated.—Scattered. *Lat.* **dissĭpātĭo,** a dispersing.
Adjuncts.—Additions. *Lat.* **adjunctĭo,** an addition.
Garnish.—To beautify. *Fr.* **garnir,** to adorn.
Foliage.—Leaves. *Lat.* **fŏlĭum,** a leaf.
Luxury.—Lavishness. *Lat.* **luxŭrĭa,** extravagance.
Acetarious.—(Of plants.) Eaten with vinegar. *Lat.* **ăcētārĭa,** salad prepared with vinegar and oil.
Succulent.—Juicy. *Lat.* **succŭlentus,** full of moisture.
Blanched.—Whitened. *Fr.* **blanc,** white.
Culinary.—Belonging to cooking. *Lat.* **culīna,** a kitchen.

PRONUNCIATION. Exercise on sounds of *O* in

oar, sore, more, lord, oath, nothing, a cloth, to clothe, his clothes, both, hoarse, those, most.

Part I.

IN a former lesson you are told that meat is a very important part of our diet; and you should now learn that we should not be healthy and strong if we did not eat a proper quantity of vegetables with it; for meat taken alone, would be too clogging and exciting, to maintain us in good health. Vegetation is essential to the life of all the lower animals. Without the fresh green grass and herbage, upon which the sheep and cattle feed and grow fat for the butcher, we should have no meat. So, you see, vegetables are really more important and valuable than some of us have hitherto thought.

Those which are cultivated to be cooked and eaten, receive the general name of *culinary*, or kitchen vegetables; and when they are used as they are gathered, they are further described as *fresh* vegetables, to distinguish them from those which are dried before using. We have a great variety of fresh vegetables, but they are not all of equal value. The more important either assist in forming material for the actual growth and repair of the body, or help to maintain its proper heat. These are called **esculents,** because they are good for food. Such are potatoes and artichokes, carrots, parsneps, turnips, peas, and beans, the several varieties of cabbage with broccoli and cauliflower, spinach, sea-kale, asparagus, and vegetable marrow.

But we also use small quantities of onions and leeks, of parsley, mint, thyme, sage, marjoram, fennel, and similar vegetables, which we term **herbs,** to flavour soups and stews, or in sauces to tempt the appetite by making *insipid* food more savoury and agreeable.

Among all our fresh vegetables, however, the **potato** is, perhaps, the most important. It is very wholesome and nutritious, and as it has no peculiar flavour, we do not tire of it. Next to the cereals it is more extensively used as food than any other vegetable product.

Perhaps you may think that, because it grows under the soil, the potato is a root, but it is really a **tuber,** or swollen part of the underground stem of the plant, and the "eyes" are the buds by which the potato plant is propagated. A root never bears buds. The potato is easily cultivated, requiring comparatively little care and skill, and only moderately fertile soil, to yield an abundant crop. An acre of potatoes is estimated to produce double the quantity of food that can be obtained from an acre of wheat. So that the cottager finds the potato a cheap and profitable vegetable to cultivate in his garden.

There are several varieties of the potato, too, which ripen at different times in the year, so that it is quite possible to obtain this vegetable fresh dug at nearly all seasons. Of course potatoes must be stored during frosty weather, but they will keep perfectly good in a dry, dark place, or carefully covered with earth. Two kinds of potatoes are particularly distinguished as *mealy* and *waxy*. Most persons prefer the former, and are delighted when they cook like a "ball of snow." You may test the quality of potatoes by lifting them in your hand as you would judge of an orange. If good they are heavy in proportion to their size. Their weight is caused by numberless grains of starch which lie closely packed in the raw potatoes. But when they are being cooked the warm water swells these grains, and as they then require more room they break the surface and spread themselves over it in a beautiful white floury coat.

Waxy and watery potatoes are not so good for food. Excellent potatoes are often spoilt by bad cooking, while by careful management inferior ones can frequently be much improved. Perhaps you think anybody can cook such a common vegetable properly. So difficult is the attainment known to be, however, that perfect success in dressing potatoes has been fixed upon as a test of the skill of a cook. Are you a good cook?—and—Can you cook a potato well?—are nearly equivalent questions.

Potatoes should be chosen of medium size, and they may be dressed in various ways, though they are most commonly boiled or steamed. Many persons say that they are only cooked to perfection when boiled in their skins, as in Ireland; because when they are pared before cooking, a great deal of the starchy substance in them is wasted. When the potatoes have been well washed and brushed to free them from all dirt, they should be put into an iron saucepan, for they would boil too fast in a tin one, and be just covered with cold water. They must then be set over the fire, and allowed to cook steadily until about five minutes before they are done, when the process may be quickened. As soon as the water boils, a little salt should be added, and a small quantity of cold water to lower the temperature. The time required to cook them varies from twenty minutes to three-quarters of an hour, according to the kind of potato. You can easily find out when they are done by trying them at intervals with a skewer or fork. If the skewer will go through easily, they will do. Those who cook potatoes, and serve them up half-raw, ought to have all the hard parts for their share. When they are thoroughly done the water should be poured off, the potatoes sprinkled with salt, and only partially covered with the saucepan-lid, to allow the remaining moisture to evaporate. The drying should be completed by the saucepan being set on the oven for a few minutes; or held over the fire, and shaken every now and then, to prevent the potatoes sticking to the bottom.

Raw potatoes contain a poisonous substance, which is destroyed or *dissipated* in cooking, and that is the reason why the water in which they have been boiled should not be used for any other purpose. So, when you make an Irish stew you must remember to cook your potatoes first, and pour the water away. Some persons will have the skins removed from the potatoes before they are boiled, in which case they should be peeled very thinly, and the eyes or other specks be carefully cut out with the point of a knife.

Large kidney potatoes baked in an oven, or roasted in the ashes under the grate, are very delicious, only they must be turned at intervals to ensure their being well done in all parts.

Jerusalem[1] **artichokes** are tubers also, but they do not cook mealy like potatoes. They are something like sweet turnip. But there are some roots which we use both as *adjuncts* to meat, and as flavourings. The chief of these are carrots, parsneps, and turnips.

Carrots and **parsneps** are superior food to turnips, because they contain more sugar, fat, and starch. When young they are very nourishing and digestible. They are good additions to boiled beef. Parsneps and salt fish are excellent eating. Old carrots are tough and only fit for soups and stews.

Turnips are very watery, but they are light and easily digested, especially when mashed, and they form an agreeable addition to either boiled or roast mutton. The Swede variety, though generally considered too coarse for the table, is really excellent, and far more nutritious than the white.

Beet is another root, but it is oftener boiled and used cold, either to *garnish* dishes, or steeped in vinegar as a salad, than as an ordinary vegetable.

When the above-mentioned roots are dug up, the soil which clings to them should be allowed to remain until they are required for use, as it protects the skin and little fibres from injury, and the vegetables themselves keep fresher. Before they are boiled they should be well washed, and if they look at all withered they should lie in water or moist earth for a little while.

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[1] Corrupted from It. *girasole* or sun-flower. Lat. *Helianthus tuberosus.*

The carrots and parsneps should then be scraped, and each cut into about four pieces lengthways; and the turnips should be thickly pared and quartered. But the beetroot must neither be scraped nor pared, for if you bruise its delicate skin you will make it black, and the red juice, the beautiful colour of which we all admire so much, will run out.

Part II.

ANOTHER important class of vegetable food, which we may term **green vegetables**, from the colouring matter in their leaves, are more valuable for their *saline* and medicinal juices than for their nutritive qualities. This group includes plants of which we eat the **foliage**, as in the different varieties of cabbage, turnip-tops, and spinach, the young shoots in Brussels sprouts, asparagus and sea-kale; the flower buds in cauliflower and broccoli; the fruit and pod in kidney beans and scarlet runners; the fruit in vegetable marrow; and the seeds in peas, broad beans, and some others.

Taken alone these could not support human life long, but eaten freely in their season they purify the blood. They are all more or less **antiscorbutic**, that is, they are an effectual preventive against the terrible disease of scurvy, which is apt to attack persons who neglect to use, or cannot obtain them, as is the case sometimes with sailors.

These vegetables are therefore very valuable, eaten with meat, and healthy persons can easily digest any of them fresh-cut from the garden. But stale vegetables are neither pleasant to the eye, nor good for food. They are tough and leathery. Hence it is most desirable that persons possessing even a little plot of ground, should devote it to the cultivation of a few vegetables, especially potatoes and cabbages. It is difficult to overrate the value to cottagers of the produce of a kitchen garden. Those who have tried it, can assure the inexperienced, that their labour and pains have been more than repaid, by the increased health and vigour of every member of their families.

Persons who are obliged to be dependent upon the green-grocer for a supply of vegetables, cannot always get them as fresh as they could wish. But if such vegetables look drooping, they may be greatly revived by cutting the ends of their stalks, and putting them awhile into water, like a bunch of flowers.

When you purchase green vegetables you should select those of medium size, because they are more juicy and tender than very large ones.

To prepare them for cooking, you should thoroughly wash and carefully trim them, by cutting off decayed leaves or any injured parts. But you should remember to avoid waste, because it is sinful, and because vegetables are dear to buy, especially in towns; and persons often carelessly throw away what ought to be used. Refuse leaves should be given to rabbits or pigs.

Next, you should let all green vegetables, except peas and beans, lie in salt and water a little while to free them from caterpillars, slugs, and insects, which are almost sure to be concealed among their leaves.

Kidney beans and scarlet runners are cut into thin slices before they are cooked.

Peas and beans belong to the *leguminous*, or pod-bearing plants, and are very rich in a flesh-forming material called *legumin*, which closely resembles the casein of milk, about which you have read before. Eaten young they are both nutritious and easily digested, and this is especially true of kidney- and French-beans. But when they are old they are not so good, because the outside skin becomes tough and hard. All green vegetables require to be thoroughly cooked, and should be boiled fast, with the lid kept off the saucepan, so that the scum which arises on the surface of the water may be removed as it appears. The fresher the vegetables the better will be their colour and their flavour; the former can always be easily preserved by putting a little soda into the saucepan with them. As soon as they are well done they should be strained and dished, for if they be allowed to remain longer in the water they become insipid.

In addition to the vegetables with which we are most familiar, there are several others which our forefathers used, of the value of which we are ignorant.

But at least two others might be put on our list with advantage, namely, the young shoots of the common stinging nettle, which when cooked are as delicate as spinach, and the tender foliage of the dandelion, which is excellent, especially if a small quantity of the broad-leaved sorrel be boiled with it.

We may mention also the young shoots of wild hop, which are nearly as delicate as asparagus; and hedge garlic, called also Jack-by-the-hedge, or sauce-all-alone. This last has the tastiness of the onion, and none of its after-odour.

English people do not half understand the boon that a few vegetables and herbs are to the poor in making the most of a small quantity of meat, and rendering appetizing and savoury many a scrap of bacon that would be comparatively untempting without their aid. But every French peasant-woman, however poor, knows this, and has her stock of flavourings always close at hand. When our cottagers' wives have to buy every sprig of mint or thyme and every onion, of course they justly regard them as expensive *luxuries* that they must sometimes do without.

Besides all these, however, you know there are some vegetables which we eat raw with vinegar, oil, or salt; either in their natural state or blanched. These are called acetarious or **salad plants.** They are chiefly useful because they are comparatively rich in saline matter, especially in some salts which are generally extracted from cooked vegetables in the process of boiling. Our ancestors knew the value of the herbs of the field far better than we do. Salads, like other vegetables, are now used by the poor much less extensively than they were formerly, and than they ought to be.

Our commonest salad plants are **mustard and cress,** which doubtless some of you have grown to form the initial letters of your name, or other ingenious devices; **lettuce,** both the cos or upright, and the cabbage or spreading varieties; **endive,** which resembles lettuce; **radishes,** which are very tasty with bread and butter or cold meat; young **onions, celery,** and **cucumbers.**

Watercress is very highly esteemed. It is exceedingly wholesome, because it contains a large amount of mineral matter. The young shoots have a pleasant, warm taste; they should be gathered, if possible, from running water, or at any rate from pure water if it be still. A walk into the country to gather watercress for yourselves you would find to be both healthy and pleasant, because the fresh air and the exercise are invigorating, and the search for the cress furnishes an object for the journey. The bronze-leaved variety is most esteemed; probably it owes its hue to a slight trace of iron furnished by the water. Watercress is good nearly all the year round, and doctors frequently order it for persons with weak chests. We take it with bread and butter and salt at breakfast or tea, or in a mixed salad at dinner. But the French use it as a vegetable also. Some of you may say, "Who ever heard of boiled watercress?" Evidently our continental neighbours find it very good, or they would not eat so much of it. You will be surprised to hear that thirty wagon-loads, each worth 12*l.*, are said to pass daily into Paris, so that in that city alone they spend no less than 360*l.* every day on watercress, which has, of course, to be extensively cultivated.

The young shoots of dandelion *blanched* are another favourite salad with the French and Italians at which we are unwise enough to turn up our noses.

Salads are most grateful to us in summer, because they introduce large quantities of water into our bodies just when they most need it. Being so crisp, and cool, and *succulent*, too, they are a delightfully refreshing addition to richer foods. But salads require most thorough and careful cleansing, because little **parasitic** plants as well as insects cling to them, which, if eaten, might injure us.

You must remember to cut the roots of lettuce and celery under water, so as not to expose the cut stem and leaf-stalks to the air. Then, if you leave them in water, they will continue to imbibe more fluid until the tissues are quite full, and they will be nice and crisp.

Cucumbers must be peeled, because the rind is unwholesome and indigestible. They should then be very thinly sliced, and eaten with a little oil and vinegar. *Vegetable marrows* make very good pies when apples are scarce or too dear, which is often the case.

LESSON VIII.

FARINACEOUS OR MEAL FOODS.

DERIVATIONS.

Constitutes.—Forms, makes up. *Lat.* **con-stĭtŭo**, to construct.
Essentially.—Of necessity. *Lat.* **essentĭa**, the essence of a thing.
Granule.—A little grain. *Lat.* **grānum**, a grain.
Microscope.—An instrument to examine small things. *Gr.* **mikros**, little; **skopeo**, to see.
Muslin.—*Fr.* **mousselin**, from **Mossoul**, on the Tigris, the town where the fabric was first made.
Glistening.—Shining. *A.-Sax.* **glissian.**
Existence.—Being. *Lat.* **ex-sisto**, to be.
Invented.—Devised, contrived. *Lat.* **in-vĕnĭo**, to find out.
Distil.—To separate by vapour, drop by drop. *Lat.* **stilla**, a drop.
Intricate.—Involved. *Lat.* **intrīco**, to entangle.
Resemble.—To be like. *Lat.* **sĭmĭlis**, similar.
Astringent.—Binding. *Lat.* **a-stringo**, to draw close

PRONUNCIATION. Exercise on sounds of *O* in

ghost, throw, to sow, snow, to mow, to crow, to know,
to blow (wind), soul, sown, thrown, known.

FARĪNA is the Latin term for meal or starch; hence the high-sounding title at the head of this chapter simply means, starchy foods. They sometimes receive the still more learned name "amylaceous," derived from the Greek **amulon—a**, not, and **mulos**, a mill—meaning, prepared without a mill.

You all know the appearance of starch used at home for stiffening linen, but possibly it never entered your mind that the substance could be a food. Nevertheless, it constitutes the most important member of the heat-giving foods of human beings. It is essentially a vegetable production, and is found abundantly diffused throughout all plants. It is specially present in the cells of the potato, in the seeds of all the cereals, and also in the fruit, pith, leaves, and stems of other plants.

If you were asked to say what starch is, you had better look at some arrowroot before you reply, and then you will find that it is a white powder consisting of tiny grains, called granules. These granules vary in form according to the different plants from whence they are obtained, and may be round, flat, or star-shaped; but you could not see this with the naked eye. If, however, you were to take a peep at them through a microscope, you would be astonished to see the real shapes of these tiny particles. Thus, the starch-grains of wheat are roundish, and appear as if they were composed of many minute layers of substance; those of the potato are of similar formation, but are larger granules and somewhat oval in shape, rising into a cone-like point; the granules of rice are very small and less regular in form, but are more like chipped and oddly shaped fragments.

But in whatever form it appears, starch is always the same substance chemically. If you like to try for yourselves, you will find it very easy to separate the starch from another vegetable substance. This you can do by washing a small piece of dough in clean water passed through muslin. The liquid will become cloudy, but if allowed to stand still for some time, a white powdery substance sinks to the bottom, and this is pure starch. The sticky matter left behind is

gluten, the nourishing principle of which you will read in your lesson on bread and cake.

The purest form of starch food is found in arrowroot, sago, and tapioca.

Arrowroot is a costly form of starch-food, because to make it nourishing in puddings, milk and eggs must be added. It is, however, frequently employed with milk for preparing a light kind of gruel for sick persons. If made with water it affords little or no support, unless a glass of port wine be added to make it stimulating. The best arrowroot comes from the West Indies, though considerable quantities are also imported from Hindostan. It is obtained from the root-stocks of a plant called Maranta, largely cultivated in Barbadoes, S. Vincent, and Bermuda. It was called arrowroot because the Indians thought that it cured the wounds made by poisoned arrows.

Sago is procured from certain species of palms. The trees are felled, split open, and the starch removed, by crushing and washing the pith. One tree is said to yield from 100 to 800 lb. of sago. The ball-like appearance is given by forcing the half-dried starch through a sieve. Pearl sago has a white glistening lustre, the result of a method invented by the Chinese, but it does not possess any greater nutritive value than the browner and coarser kinds.

Simple light puddings made of sago and milk, form wholesome food for invalids and children.

Tapioca is prepared from the rhizomes, i. e. underground root-stocks of the cassava plant, a native of South America, and grown largely in British Guiana and West Indies. Native cassava bread is from the same source, and is prepared by pounding these rootstocks to express the juice and separate the starch from their woody fibre.

Rice is produced by one of the corn-food, or cereal, grasses; and it is grown, threshed, and winnowed, in the same way as wheat is in this country, but requires a warm climate and abundant moisture to ripen it.

It is largely employed as a food in those countries where it is extensively grown, but it cannot be said to support a really healthy or vigorous race of men, for only about $\frac{1}{12}$ of its whole bulk consists of nitrogenous matter.

The grain, being very hard and dry, keeps well, and is easily conveyed from place to place, and hence it is imported into England in large quantities. It is usually sent before being deprived of the outer husk, and is then called paddy or paddee. Rice fields are called paddy fields.

There is relatively a small quantity of gluten in rice, and hence, though it is sometimes ground, it cannot be used for making bread, because the flour will not cling together to form dough; but it is sometimes used with ordinary flour to make the bread whiter. Rice flour is used for sponge cakes.

When used as a food it is usually cooked whole, being boiled in water or milk until the grains are swollen and soft, but not broken. The best kinds of rice, in which the grains are large, are obtained from Carolina and Patna. Boiled rice is an excellent substitute for potatoes when they are scarce and dear. Many Hindoos live entirely on rice and a little butter or oil, as all the necessary ingredients of food are contained in this compound. Boiled rice and sugar or treacle, or boiled rice and a little curry with scraps of meat, make excellent food.

Rice is useful in cases of diarrhœa, but it should be *well cooked* before being given to a patient, or it will not digest easily. Rice water made a little more glutinous with gelatine is a very excellent drink for the same disorder. Large quantities of rice are used by distillers for the manufacture of spirits.

Rice straw is employed for making a very fine white plait for hats and bonnets, and also for the production of a coarse kind of paper. The Chinese make of it a very delicate kind of paper for painting upon, and some exceedingly intricate designs are beautifully worked upon it.

Indian corn or **maize** is one of the most common forms of starch used in England. It is sold under various grand names, such as **oswego**, and **maizena.** The most ordinary form of it is **corn-flour,** and it is exceedingly useful for making blancmange, and similar delicacies, to be eaten in addition to some more flesh-forming food.

Two more nourishing foods have still to be mentioned, viz. **semolina,** and **macaroni.** They are both preparations from wheat flour, and hence closely resemble it in composition. Many Italians live entirely on macaroni and a little olive oil. Semolina consists of the inner part of the finest specimens of the wheat grain crushed into powder. It is used chiefly for making light puddings—soufflées, as they are called. Macaroni is the national food of the Italians, as bread is with us. Only the best flour is used for making this.

You must often have seen it in the grocers' shops—in long tube-like pieces, and a finer variety also, thread-like in appearance, called **vermicelli.** The Latin word **vermis** means, a worm.

One of the best and cheapest farinaceous foods is **oatmeal porridge.** It is warming and strengthening, and in Scotland helps to feed one of the finest races of men ever seen.

Milk thickened with oatmeal forms an excellent, and economical food for children; far better, and much cheaper, than either tea or coffee.

NOTE.—The following extract from the 'Times' of September 10th, 1878, contains important information. Remember 8 bushels make 1 qr.

FROM HARVEST TO HARVEST.

In the twelve months from the 1st of September, 1877, to the 31st of August, 1878, the imports of wheat and wheat flour into the United Kingdom amounted to no less than 62,255,125 cwt., the equivalent of 14,808,966 qrs.; of Indian corn, 40,746,135 cwt., or 9,474,432 qrs.; of barley, 14,201,373 cwt., or 3,976,384 qrs.; of oats, 12,286,354 cwt., or 4,467,765 qrs. Adding also peas and beans, the total importation of corn in the twelve months reached 134,430,348 cwt., or 33,858,689 qrs., this last number being substantially the same as the estimated number of the population of the United Kingdom. In neither of the two preceding twelve months did the imports of corn reach 119,000,000 cwt.

LESSON IX.

BREAD AND CAKE, AND HOW TO MAKE THEM. THE VALUE OF BROWN BREAD.

DERIVATIONS.

Cereals.—Corn grasses. From **Ceres**, the mythological goddess of corn.
Mature.—Ripe, in perfection. *Lat.* **mātūrus**, ripe.
Fermented.—"Raised." *Lat.* **fermento**, to cause to swell.
Evaporating. — Escaping in vapour, vanishing into air. *Lat.* **ē-văpōro**, to disperse in vapour.
Adhesive.—Clinging. *Lat.* **ăd-hærĕo** (perf. **adhæsi**), to stick to.
Gluten.—A glue-like substance. *Lat.* **glūten**, glue.
Utilized.—Used, made of service.
Penetrate.—To pierce into. *Lat.* **pĕnĕtrātĭo.**
Unrivalled.—Unique, having no equal.
Particles.—Minute parts. *Lat.* **partĭcŭlaris**, concerning a part.
Development, a spreading abroad. *Lat.* **dēvēlo**, unveil, uncover

PRONUNCIATION. Exercise on sounds of *O* in

loaf, only, none, stone, moan, gone, bone, home, whom, to owe, low, dough.

Part I.

MANY vegetable productions are highly important for food, but none are so really valuable as the cereals, as they are called. These corn grasses supply us with grain of various kinds, the chief of which in temperate countries are wheat, oats, rye, and barley. These all attain great perfection in our own country, and other parts of the world enjoying a similar temperature.

To mature rice requires a warmer and moister climate. It flourishes in India, and large quantities are exported thence, as well as from some parts of America.

Maize or Indian corn, and millet, need a considerable heat to ripen them. Maize is frequently grown as an ornament in English gardens because of its light, feathery appearance, but it never ripens well.

The flour, or meal, of whichever of these grains is used, is first mixed with water into dough, which, when kneaded and made into loaves, is baked and called bread, because it was once made of brayed or bruised corn. The English and most civilized nations inhabiting temperate countries commonly employ wheaten flour.

In Scotland, oatmeal is largely used for making oat-cakes, which are said to be more nourishing than those made of flour of wheat, because oats contain more gluten than wheat. Oatmeal cannot be made into bread loaves, because it has not enough starch. On the Continent bread made of barley or rye is extensively eaten. The loaves are of a darker colour than our brown bread, and they are said to keep better than our white bread. If rye be made into bread, it should be carefully looked over before being sent to the mill, and the large thick ergot grains taken out and burnt, or they may cause fearful diseases. In America, maize and other meal is chiefly made into cakes to be eaten hot.

The inhabitants of some countries use the fruit, pith, or seeds of various trees for bread. The bread-fruit tree is invaluable to the islanders of the South Seas; as the date or "bread of the desert" is to the Arabs. The people of South Europe frequently use dried and pounded sweet chestnuts for making cakes, to supply the place of bread.

Much of the corn consumed in England is home-grown. No doubt you are all familiar with the appearance of a corn-field, and possibly you may have watched the gradual growth of the tiny plants destined to produce fruitful ears. First a single delicate blade of grass shoots up in the spring-time, and gathering strength as the warm days come, it grows taller, and then at the top of a long stalk the ear appears. Here the little seeds in their cases catch the sun's rays, and wave to and fro in the breeze. During the summer they all mature and become of a beautiful golden yellow. Then we know that the corn is ripe and ready for the reaper, and grateful gladness should fill the hearts of all who have the chance of looking at a field of waving corn, for we can scarcely overvalue the blessing of a good harvest.

But our little island home is now too densely peopled to admit of our growing enough corn for the wants of all, so immense quantities have to be imported annually from foreign parts. You will better understand the extent of the trade, if you remember the note from the 'Times' at the end of last lesson; and when you read that the average weight of our corn imports annually is about 6,000,000 tons, and the cost of it is more than 50,000,000*l.* Perhaps you could reckon how many quartern or 4-lb. loaves that would make, when you are told that it takes 3¼ lb. of flour to make one quartern loaf.

Very nearly half of this extra supply comes from Canada and the United States of North America; but we receive much also from France; and more from Russia, and in 1875 India began to send us considerable quantities of wheat in addition to rice.

Bread may be divided into two chief kinds: fermented, such as we are accustomed to use in England;

and unfermented, as the Scotch oat-cake, Australian damper, the Jewish Passover cakes, and the aërated bread made according to Dr. Dauglish's method, which was patented in 1856–7.

Fermented bread is generally preferred, as being the most wholesome, palatable, and digestible. Fermentation is accomplished by mixing some kind of yeast or leaven with the flour. Several substances would answer the purpose, but yeast is generally used, either the dry German kind, or the liquid form as obtained from a brewery and called brewers' barm.

The yeast used in making bread, acts upon the starch of the flour and converts part of it into sugar; hence the sweet taste of good bread. During the process carbonic acid gas is given off, and this trying to escape in minute bubbles, stretches out the tenacious dough and forms tiny hollow spaces, something like those in a sponge. Hence bakers commonly term mixing the yeast with the flour, "Setting the sponge."

When the dough has been well and carefully mixed, the tiny, roundish holes, or cavities, formed by the carbonic acid gas, are equally distributed. Large cavities in a loaf, are generally signs of careless and imperfect mixing and kneading.

German yeast is made by evaporating the watery particles from the yeast produced during the distillation of gin or Hollands from rye. This yeast acts more quickly than any other, and the use of it has much increased of late years. Housewives making small quantities of bread at home, find it very convenient. Bakers frequently make their own ferment with a mixture of potatoes and yeast. The leaven mentioned in the Bible, was a portion of fermented dough kept back after each baking.

The flour of wheat, as we have said before, is generally considered to be the best adapted for making bread, because of the tenacity of its "gluten." If you mix flour with water, you will at once see that it is the adhesive character of the gluten which causes the paste to cling together in one mass.

Part II.

To ensure good bread we must be careful to see that the flour is sound, dry, and not made from rusty, unripe, or damp grain. Different qualities of flour may be purchased, the chief of which are **best white, households,** and **seconds.** The whitest flour is not really the best, although it looks best, and we have to pay a high price for it; for the preparation of it is expensive, and only the very middle of the grain is employed, all the rest being removed. Thus that part of the seed nearest the little brown coat is lost, and it is that which contains the largest proportion of gluten; which you know is a nitrogenous, and therefore a flesh-forming substance. It corresponds closely with the albumen of animal food.

For households flour, the bran or outer husk only is removed from the grain before it is ground; therefore you can understand that this is without doubt the most economical.

In entire wheat flour, as the name denotes, every particle of the grain is utilized. The bran is so finely ground that it does not irritate the digestive organs. It is, unfortunately, but little, if at all, used for bread-making; but is exceedingly valuable in the manufacture of food for young children and invalids.

Such flour contains the chief elements for sustaining life; thus—

1. Flesh-forming material in the gluten.
2. Heat-giving material in the starch.
3. Bone and teeth-making matter in the earthy phosphates of the bran.

The real quality, however, of a loaf depends in a great measure on the baking. The heat must be sufficient to penetrate to the middle of the loaf, or it will become heavy and sodden; while if the oven be too fierce the outside gets burnt and the crust spoiled.

An oven with a brick floor is considered the best for the purpose. Iron plates, such as are to be found in most of our cooking ranges, generally become too hot to bake a loaf, and are apt to spoil the crust. Nevertheless, careful housewives, with watchful attention, make excellent bread and bake it in the ordinary ovens of a cottage kitchener. Home-made bread is the sweetest and best. The bakers mix potatoes and alum with the cheaper sorts of bread. Alum makes it look beautifully white, and so ignorant people prefer it. If it were known as it ought to be, that the whiter the bread the less nourishing it is, this kind of adulteration would stop, because people would refuse to buy it.

It is very unwise to eat new bread, because it cannot be readily masticated, and is more difficult of digestion. A loaf should never be cut until it is at least a day old.

Even when very hard and dry, bread should not be wasted. Stale bread makes the best toast, and broken pieces may be soaked in milk and used for puddings with the addition of some currants or sultanas and a little spice. "Waste not, want not," applies to bread as well as other things.

Brown bread, as now made, consists of the whole-meal flour, and, on account of its mechanical influence, is sometimes recommended by medical men as a remedy for constipation. Others again are of opinion that the flakes of bran irritate the digestive organs, and do not permit the stomach to retain the food sufficiently long to make the best use of it. So we must leave the question undecided, but it would be wise for persons to try the experiment and judge for themselves. There is no doubt on one point, namely, this. Those who can eat and digest brown bread, are much more likely to be healthy and strong than those who have only white. A change from one to the other may be recommended as very pleasant.

Fancy bread includes a great many varieties of rolls, twists, cakes, and loaves. Some of them differ from ordinary bread only in shape, others are mixed with milk. This kind of bread is not sold by weight, hence it is not nearly so economical for family use; but it is very pleasant to eat.

Besides household and fancy bread, there are two other kinds largely used by the inhabitants of London. The first is the **aërated,** the dough of which is mixed and the loaves shaped by machinery. No ferment is used during the process, but water charged with a certain proportion of carbonic acid gas is worked into the dough to raise and lighten it.

The other, called **Nevill's Welsh bread,** is produced from ovens heated by boiling water or steam, in the largest existing bakery in the metropolis, and is generally excellent.

Cakes in numberless varieties are made; they are not nearly so economical as bread, but they are generally in favour, especially with children. Good plain, wholesome cakes are made of bread dough, with the addition of currants, shortening, and a little spice. Cakes of this kind eaten hot are very common in the North of England. Between this class of cake and the rich **pound cake** there are numerous varieties, such as rice, sponge, sultana, madeira, seed, and plum cakes, and others of every degree of indigestibility, of which the less you eat the better for your comfort.

Biscuits, so called from the French word meaning *twice baked*, are now largely manufactured and extensively used. Perhaps some of you may have travelled by Great Western Railway as far as Reading. If so, you must have noticed the immense biscuit factory of Messrs. Huntley and Palmer, where nearly 3000 workpeople are employed. Many varieties are manufactured, from the hard captain's biscuit to the pearl and the little gem. Some contain butter, eggs, sugar, spices, and flavouring matters of various kinds. Cakes of all descriptions are made in the same establishment. Even bride cakes may be seen in every stage of development, from the plain cake ready for icing and sugaring, to the most elaborately ornamented specimens.

A similar factory nearly as large as that at Reading is established in Bermondsey, by Messrs. Peek, Frean, and Co.; and there are many smaller establishments, as those at Shadwell, in the East of London, and in Glasgow.

English biscuits are well known abroad, and the manufacturers are almost unrivalled in continental markets. Dr. Edward Smith is of opinion that biscuits contain a larger proportion of nutriment than the same weight of bread, but we must remember at the same time that they are not so easily digested unless the particles are thoroughly separated in mastication; and generally it is well to remember that **the more thoroughly any food is masticated, the more nutritive does it become.**

LESSON X.

FRUIT, AND HOW TO PRESERVE IT.

DERIVATIONS.

Prescription.—A direction in writing, or otherwise. *Lat.* **præscriptĭo**, a writing before.
Permission.—Leave. *Lat.* **permissĭo**, ceding or giving to another.
Orchard.—A garden for fruit trees. *A.-Sax.* **ortgeard**=wort-yard, a herb garden.
Appreciated.—Valued. *Fr.* **apprécier**, to set a price.
Compressed.—Crushed together. *Lat.* **compressio**, a pressing together.
Variations.—Changes. *Lat.* **vărĭus**, different.
Gradually.—By slow degrees. *Lat.* **grădus**, step by step.
Blanched.—Made white. *Fr.* **blanc**, white.
Gooseberry.[1] The English word is corrupted from *gorseberry*, from the roughness of the shrub.

PRONUNCIATION. Exercise on sounds of *O* in

own, oak, stroke, a road, he rode, toad, broad, oats, hot, wrote, goat, boat.

ALMOST all persons, young and old, are fond of fruit, and we regard it as such a desirable addition to our necessary food, that we take great pains to secure a supply of it. The general opinion is that freshly-gathered ripe fruit is always wholesome; and some eminent doctors say that everybody who wishes to be

[1] *Lat.* Ribes grossularia.

healthy ought to eat a little, either raw or cooked, daily. That is such a pleasant prescription that few of us would object to follow it; only that those who live in towns, find it scarcely possible to obtain fruit as cheap, or as fresh, as those can who live in the country; and stale fruit is not nearly so good as fresh.

Perhaps some of you have visited a strawberry garden, or a cherry or an apple orchard, when the fruit was ripe, and have had permission to pluck as much of it as you liked to eat. How you must have enjoyed the feast! Then you tasted the flavour of the fruit in its perfection, and could not fail to notice how much richer and more delicious it was than that of the strawberries, cherries, or apples that you buy in the shops.

We have great abundance and considerable variety of fruits in England. Besides those already named, we may mention that our **raspberries, gooseberries, currants, plums,** and **pears** are excellent. It is true that **grapes, peaches, apricots, nectarines, pineapples,** and **melons** will not always come to perfection in England, in the open air; but those who choose to go to the expense and pains of making an artificial climate for them in vineries and hothouses, can grow even these of unrivalled quality. You know by the placards in the shops that we import great quantities of grapes from France, Spain, and Portugal; melons, **oranges, lemons,** and similar fruits from Southern Europe; and pineapples from the West Indies.

Raw fruit is considered more digestible at some times in the day than at others, as the following old-fashioned saying tells us—"Fruit is gold in the morning, silver in the afternoon, and lead at night." So you had better eat your daily quantity, if you can get it, as soon as possible after you get up.

We cook a great deal of fruit in various ways. Sometimes we simply stew it; at others we use it to make puddings and tarts; and no doubt you have often baked apples for yourselves in the oven. Now you are quite aware that we cannot get fresh fruit all the year round, and yet we like these dainties too much to be willing to resign them when they are out of season. Consequently different plans have been tried so to preserve fruit, that we can have an abundance both for pastry, and for dessert, in the winter time.

But in order to be within the reach of all persons, it was necessary that the methods employed should be cheap as well as successful.

Such fruits, as apples and pears, are easily kept. They should be plucked when ripe and quite dry, and wiped to free them from all dirt and moisture, and then stored in a dry place. You must, however, be careful to see that they are perfectly sound, for if there be any bruised ones among them, as there will be if they have been shaken from the tree, they will soon decay themselves and cause the rest to rot. It is well also to examine them at intervals, since to secure a good supply of apples and pears for food at Christmas is worth much trouble and attention. Some foreign fruits, such as **raisins, figs, prunes, dates,** and **tamarinds,** are preserved by drying.

Muscatels, as the sweetest and highest-priced raisins are called, are grown in Southern Europe. They are grapes dried—thus. After the surrounding vine-leaves have been removed, the footstalk of each bunch is carefully cut half-way through, and the fruit is allowed to hang undisturbed until it is ready to pack in boxes for exportation. Hence muscatels are sometimes called "raisins of the sun."

The delicious, small, seedless raisins, called **sultanas,** we receive from Turkey.

Currants are also small grapes, and are so called because they were brought first from Corinth, in Greece. They were once called Corinths.

You may have eaten **figs** in their green state, for they often grow in English gardens that are in chalky soil. But the Mediterranean coasts and Southern France supply us with our dried ones. Figs are largely grown and highly appreciated throughout Central Europe Asia, and Africa.

We import **prunes,** or dried plums, and the delicious Orleans plums from France and Portugal.

Dates and tamarinds are sun-dried and sent to us from Persia, India, Arabia, and Egypt.

And we must not forget to name the apples which after being dried and compressed come across the Channel to our markets as **Normandy pippins.**

We do not usually dry our fruits to preserve them, however, because they are mostly of such a nature that by this process they would lose much of their delicate and agreeable flavour, which we are anxious to keep. So we either bottle them, or saturate them with a solution of sugar and water, or boil them with sugar into jam.

Always remember that fruit to be preserved must be gathered in dry weather, with the morning sun shining fully upon it, because its flavour is richest then, and it will keep better. If it be gathered in damp or foggy weather, it will mildew in a few hours.

Should it be inconvenient to you to use the fruit at once, set it aside in a cellar, dairy, or some other cool dry place, until you are ready to attend to it.

Gooseberries, either green or ripe, currants, and plums, and especially damsons, are preserved by the simple method of **bottling**, by which we can ensure that the fruit for several months, at least, shall retain almost the same flavour as it had when first plucked from the tree.

The following are three variations of this process practised by different persons, each of which is said to be the best by the housewives who adopt it by preference:—

(1) Having examined the fruit to see that it is quite sound and perfectly dry, you should pack it into wide-mouthed earthenware jars. Then, after tightly corking them and hermetically sealing them with resin, dig a hole in the ground and bury them until you want to use the fruit.

(2) Some persons prefer to set the jars in a moderately warm oven, and let them remain there all night; then the next morning pour a layer of melted suet over the top of the fruit, and tie the jars down with bladder previously softened in warm water.

(3) But you might try the simple but very successful plan of packing your fruit into bottles, which you should loosely cork and wrap round with haybands. Then you should put them into cold water, which you must gradually bring to the boiling point. When the water has cooled again, take the bottles out, cork them tightly, and secure them with resin or wax.

It is necessary that these and all other preserves be kept in a dry place, or they will soon become mouldy.

Some of you may have seen apricots, cherries, egg plums, and similar fruits preserved whole for dessert. This is accomplished by scalding the fruit two or three times successively, with a solution made of 2 lb. of the best loaf-sugar, to every pint of water used. Of all fruits subjected to this process none look so pretty as the little, round, red-cheeked **Siberian crabs,** if they have long stalks.

Our commonest way of preserving fruit is by boiling it down with sugar, and thus converting it into **jam.** Almost all fruits will make good jam, if you do not try to practise the false economy, of stinting the quantity, or using an inferior quality of sugar. And in these days of cheap sugar such a proceeding would be quite inexcusable, and a great mistake, as the jam would be spoiled.

The preserving pan is generally made of copper or bell-metal, though it is sometimes of iron lined with enamel. But whatever the material, it should always be kept scrupulously clean and bright.

This being ready, you must next prepare the fruit. The stalks should be removed from strawberries, raspberries, gooseberries, and currants, and the stones from apricots, peaches, and plums. But it is well to crack a few of the stones and put the blanched kernels into the jam when it is made, for they give it a very nice additional flavour.

Weigh your fruit, and for every pound of it put into the preserving pan $\frac{3}{4}$ lb. of the best loaf-sugar, for remember that is most economical. If the jam be required to be very luscious, equal weights of fruit and sugar are used.

When you have filled your pan, set it on a trivet or hot plate, for if you put it on the open fire very likely the fruit will burn, and spoil the bottom of the pan, and the taste of the jam. Stir it frequently to prevent its sticking, and let it boil gently until the surface sinks down and looks glassy. Then you will know that it is sufficiently done. Have your jars dry and ready at hand, and pour it at once into them. Many persons let the jam cool, and then put a layer of white paper dipped in brandy over it before tying it down. But others tie it down while it is hot without using any spirit, and it keeps excellently. The great object is, of course, to exclude the air.

Jam made from Seville oranges, vegetable marrows, and pineapples, is called **marmalade.** It is very extensively manufactured at Dundee, in Scotland.

All kinds of jam are very useful both in health and in sickness. No doubt you like it on your bread at tea, or made into tempting tarts for dinner. A little blackberry or black currant jam is excellent for colds and sore throats. And if you have a feverish cold you will be wise to put a dessert-spoonful of this jam into a tumbler and pour boiling water over it, for this makes a most agreeably refreshing drink.

Sometimes red or black currants are beaten in order fully to extract the juice, which we squeeze through a bag or coarse cloth. Then, after adding more sugar, we boil it awhile to thicken it, and call it **jelly.** Red currant jelly is often eaten with hare or mutton.

Besides what we prepare at home, we import great quantities of preserved fruit from abroad, and the preservation of fruit has now become an important branch of industry and commerce between different nations.

LESSON XI.

SOUP.

THE PREVENTION OF WASTE A DUTY.

DERIVATIONS.

Absolute.—Certain. *Lat.* **absŏlūte**, completely.
Utilized.—Made useful. *Lat.* **ūtĭlis**, serviceable.
Converted.—Changed. *Lat.* **con-verto**, to turn to.
Contributions.—Things given towards a certain end. *Lat.* **contrĭbŭo**, to join to as a part.
Comparatively.—By comparison. *Lat.* **compăro**, to couple together in judgment.
Effectually.—Completely. *Lat.* **ef-ficio**, to accomplish.
Customary.—Usually. *Lat.* **consŭētūdo**, habit, usage.

PRONUNCIATION. Exercise on sounds of *E* and *Ī* in
new, Tuesday, ivy, sieve, finger, shrink, the rind, the wind,
to wind, to find, to grind, to bind, the blind, women.

AT the present time, when high prices are charged for all kinds of food, it is the absolute duty of everyone to be as economical as possible. This is especially the case with regard to meat, and every scrap should be carefully utilized. In a joint there are, of course, always some tough gristly parts and bones, which cannot be eaten. But even these are rich in nutritive matter, which may be readily extracted and converted into good food as soup.

Those who have visited France or Germany say, that the peasant women make excellently flavoured soup, from odds and ends of meat and vegetables. Good nourishing and cheap soup is always ready at the railway stations. Nothing is ever wasted in any well-ordered cottage. Every scrap of food, likely to contain any nourishment, finds its way to the **pot au feu,**[1] which the economical housewife has always in readiness to receive contributions.

Soup made in public soup-kitchens in times of scarcity is always excellent and cheap. It seems a pity that it cannot be always made; but then, perhaps, some would think themselves above buying it. They should learn to make it as good for themselves.

When soup is made specially from meat, the inferior parts, and the trimmings of the large joints, are usually employed. Ox-cheek, shin, and flank of beef; and sheep's head, are the parts usually selected.

Valuable and strengthening soup for invalids is made from ox-tails, calves' feet, and cow-heel.

Meat intended for good soup should be cut into small pieces and put into **cold** water, so that all the juices may be drawn out. But fresh meat is by no means necessary for the purpose. Liquor in which meat has been boiled should not be thrown away, except that of strongly smoked and salted meats, which make the broth uneatable. This cannot be used because it is heavily charged with salt, and possesses besides some rancid particles which render it unwholesome.

Bones from cooked joints may be broken and put into the soup to give it additional strength. Fresh bone soup is specially nourishing, and the bones may be obtained from the butcher at a comparatively cheap rate. They should be placed with a little salt in sufficient cold water to cover them, and be very gently simmered for some hours—the longer the better, providing always the lid of the saucepan be kept closely shut. The only way to obtain a good and nourishing soup, is by cooking the ingredients very slowly and gradually. In this way hard pieces of bread, scraps of meat and vegetables, with proper seasoning, may be made into excellent and most palatable food. Nothing is perhaps so refreshing after, or during hard work, as a good basin of hot broth or soup. Ham or bacon bones give an agreeable flavour when simmered in the soup. Bones and fins of fish, carefully boiled down, yield a very good gelatine, for thickening all kinds of soups and gravies. If you want to succeed in making soup, you should use a large iron saucepan, and keep the liquor well stirred with a wooden spoon.

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[1] Saucepan kept simmering on the fire.

This branch of cooking requires constant attention, especially during the early steps of the process while the scum is rising; for unless this be skimmed off as it appears, it becomes partly dissolved and sinks. Though this would not greatly signify in a thick soup, such as pea, carrot, or any similar vegetable **puree**, it would effectually spoil a **clear** soup.

It is best to make the foundation of soup, or stock, as it is called, the day before it is required for the table; as then the fat is easily removed from the top when the liquid is cold and set. The strength of the soup may be readily judged from the stiffness of the jelly.

Vegetables are usually added to impart specially desired flavours. But remember that it is always necessary to wash and pick them over well before using them.

Onions require long cooking to make them tender, and therefore you must add them to the soup as soon as the scum has been removed. A bunch or bouquet of herbs, as it is called, consisting of a sprig each of parsley, marjoram, and thyme, and one bay leaf, lightly tied together, should next be put into the liquor.

Thinly sliced carrots and celery ought to be put in, about an hour before serving; while turnips require only half-an-hour's gentle cooking.

When you cannot have celery, a spoonful of the seeds tied up in a clean piece of muslin will answer quite as well for giving a flavour.

Pale-coloured soups are as a rule pleasant neither to the sight nor to the taste, and therefore it is customary to colour them slightly. Soup made with the boiled and crushed tubers of the Jerusalem artichoke, is however excellent and white.

Burnt onions are very good for colouring, and they also help to improve the flavour, if people do not object to the taste; when they do, a glass of mushroom ketchup may be substituted. A simpler method still, is to toast a piece of bread a deep brown, and simmer it in the liquor, or to put in a teaspoonful of caramel, as burnt moist sugar is called. Either will impart a rich colour, and prove a harmless ingredient in the soup.

A nice browning for soup may also be made from pea-shells, thus:—After shelling you should choose the cleanest and freshest-looking shells, and put them into a shallow tin, and set it in the oven. Bake them gently until they are crisp and brown. Then, when they are cold, keep them in paper bags until required for use. Four or five will brown a large saucepanful of soup.

When soup, broth, or beef-tea is required for invalids, it is customary either to omit the vegetables, or to strain them off; because they are apt to disagree with the delicate stomach of a sick person. If desired, broth may be thickened with a little flour, or rice, or pearl barley.

LESSON XII.

DRINKS.

WATER, TEA, COFFEE, AND COCOA.

DERIVATIONS.

Percolated.—Strained through. *Lat.* **percōlātio,** a filtering.
Gratifying.—Pleasant. *Lat.* **grātus,** agreeable.
Decoction.—A liquid obtained by boiling or seething. *Lat.* **de,** from; **cŏquo,** to prepare by cooking.
Sub-tropical.—Under the tropics. *Lat.* **sub,** under; **trŏpĭcus,** pertaining to a turn. The tropics—Cancer, 23½° N. of the equator, and Capricorn, 23½° S., are the places where the sun appears to turn back and get lower or higher in the sky. The tropics form the N. and S. boundaries of the torrid zone.
Constipation.—A confined state of the bowels. *Lat.* **constīpor,** to be crammed.
Inveterate.—Rooted by custom. *Lat.* **invĕtĕro,** to grow old.
Adulterated.—Not pure. *Lat.* **ădultĕro,** to pollute.
Aromatic.—Sweet-scented. *Lat.* **ărōma,** a spice.
Chalybeate.—Impregnated with particles of iron. *Lat.* **chalybs,** steel.

PRONUNCIATION. Exercise on sounds of *E* and *I* in
women, timber, to hie, to lie down, Friday, nine, I, such, week, witch, which, yet, get.

Part I.

POSSIBLY some of you have never really considered the wonderful importance of water as a drink. You have read that no food can be digested, or made of use in the body, except as a semi-liquid; in which the solid portions of the food are rendered so minute, that they may be drawn through a fine and delicate membrane, and then washed through extremely minute channels into the blood stream.

The chief agent in this important transporting work is water. Now, as you know, we drink a great deal of it pure; and we also take large quantities mixed with various substances to form beverages, as well as in the juices of animal and vegetable foods.

The quantity of liquid required by anyone varies according to the heat of the weather, and the kind of food taken. Thus we drink more on a hot, sultry summer day than in winter; more when we eat salt meat than fresh; and we do not require so much if we eat salad or juicy fruit.

Pure water has neither taste nor smell, and in small quantities it is colourless. **Spring water** from deep wells is generally cold and sparkling, and draughts of it are refreshing in the summer-time. Very sparkling water should, however, be mistrusted, for the sparkles may indicate that there is "death in the cup" from the presence of noxious gases. A well near the graveyard at Highgate had to be closed, because persons using the water became violently ill of typhoid fever. This was caused by the decomposed organic matter contained in the liquid, yet to all appearance it was temptingly clear and bright. All spring water contains some salts washed out of the earth through which it percolates. These generally render it "hard," causing the flakes you may have seen in the water when you washed your hands with soap; and producing the "fur" in the kettle when the water was boiled, as you have already read in the lesson on water chemically considered.

The water of some districts contains very large proportions of particular mineral matters, and is consequently termed **mineral water.** This is highly valued as containing medicinal virtues for curing certain ailments.

The waters of Tunbridge Wells have an inky taste from the **iron** contained in them, and hence they are called chalybeate waters. Others, again, have a very disagreeable **sulphur** odour, like those at Harrogate; and some have a very strong **saline** flavour, like the springs of Epsom and Cheltenham. The Latin word for salt is *sal*.

Besides water, we use hot drinks made by the infusion of certain vegetable substances, such as tea, coffee, cocoa, and chocolate.

Tea is not an English production. The Chinese were formerly unrivalled in its cultivation, which was carried on amid much mystery. Now the dried leaves are imported in large quantities from Upper and Lower Assam, Aracan, and other provinces in India, and it is also cultivated in Australia, Ceylon, and California, but by far the largest quantity comes from China.

One of the most remarkable changes in the style of living has taken place with regard to the use of tea. In the sixteenth century it was sold at ten guineas per pound, and 2 lb. were considered a handsome present to a queen. Very few then could afford such a luxury. Now the use of it is within the reach of everybody.

The following notes are found among the papers of Sir Robert Walpole, who was Prime Minister to George I. and George II.:—May 24th, 1715: Paid for a pound of Bohea tea, 1*l.* 6*s.* Paid for a pound of green tea, 18*s.*

It is very odd, too, that when tea was first brought to England by the Dutch East India Company and presented to Queen Elizabeth, it was thought right to boil the leaves well and eat them, what we call "tea" being thrown away. In Queen Anne's time tea was called tay, as it is now in France (*thé*).

The two kinds of tea used here are the produce of the same plant, the only differences being in the time of picking and the method of drying. The early leaf buds dried in the sun produce **green tea**; and the more mature leaves of a later gathering are dried artificially to form the **black tea** of commerce.

When properly gathered and prepared tea should contain three important constituents—viz. **theine,** which may be extracted in the form of a white powder; **tannic acid,** and a **volatile oil.** Besides these, there are fibrous matters, constituting the skeleton of the leaf.

To the presence of theine is due the pleasant refreshment, experienced when a weary person partakes of a cup of tea. The same white powder also promotes wakefulness, and clears the brain for thinking. Hence, moderately taken, tea is a suitable drink for a nurse watching by a sick bed, and for persons studying.

The Chinese have a fable on this property. It is said that some person long ages ago cut off his eyelids because they would close, and planted them, whereupon up sprang the tea plant.

Perhaps you would like to see some of this theine. Girls in London can see a beautiful specimen which has been extracted from tea leaves, in the food collection at the Bethnal Green and Kensington Museums.

The tannic acid is a bitter principle, similar in character to that found in oak bark, and it is that which causes the rough taste when strong tea is taken.

The peculiar delicate flavour or aroma of the tea, depends upon the volatile oil. As its name implies, this oil is very quick at escaping, and it is soon lost if great care be not taken in making tea. It is quite a mistake to boil it in an urn or stew it on the hob after it has been made, for the volatile oil flies off, and the flavour departs with it; while the seething draws out the bitter tannin of the leaf, thus making the tea dark-looking, and more or less disagreeable to the taste.

The first rule for making good tea is, as the never-to-be-forgotten old housewife said, allow one teaspoonful for each person, and one for the teapot. The next is, **be sure the water boils.** Heat the teapot by pouring in boiling water before putting in the tea, and then pour **boiling** water over it, and allow it to remain covered with a cosey, if you have one, for about seven minutes. In this way you obtain the pleasant flavour without drawing out the bitter ingredients. The cosey is to prevent the heat escaping. A **very bright teapot,** however, does not allow much heat to escape, so keep your teapot extra clean.

On account of this volatile principle, tea should never on any account be kept long in paper. Neither should it be stored near strongly-scented substances, because it imbibes the flavour of other articles near to it. Keep tea in a caddy.

Inferior qualities of tea are sometimes adulterated, in order that dishonest tradesmen may be able to supply those who insist upon having so-called **cheap** goods.

You will be astonished to learn that used tea leaves are bought up by those who are wicked enough to think robbing the poor no sin, to be dried, heated, re-rolled into shape, and then mixed with other teas. Sometimes leaves of the gooseberry bush and other plants are mixed in with the mass, or clay is manipulated with tea-dust to make the mixture weigh heavy. All these practices are wicked and grossly dishonest. But you ought to remember in this, as in everything else, that **if you wish to secure a good honest article, you must pay a fair price.** 2*s.* per lb. is the lowest you should give for black tea; and excellent qualities for general use may be bought from 2*s.* 6*d.* to 3*s.* per lb.

Once or twice a day is quite enough to drink tea. There is a peculiar disease, called tea dyspepsia, which afflicts people who are always drinking tea.

A peculiar infusion called Mató or Paraguay tea, containing constituents similar to the kind we employ, is used in some parts of South America. Herb teas are favourite domestic remedies among some country people. They consist of decoctions of camomile flowers, dandelion roots, agrimony, rue, mint, yarrow, betony, or broom leaves; and other plants also are sometimes used.

Part II.

Coffee is the dried, roasted, and ground seed of the coffee shrub, which is now extensively grown in many sub-tropical countries. Some of the finest kinds are obtained from the plantations in Arabia and in the West Indies. Ceylon and S. Domingo also export large quantities. The fruit, which is dark-red, and about the size of a cherry, contains two hard, oval seeds, almost like little beans. The outer husks having been removed by crushing the fruit between rollers, the seeds are very carefully dried in the sun for exportation.

The roasting always takes place in the country where the coffee is used, and not long before it is required for use. Many persons prefer to roast the berries at home. The object of the process is twofold; first, to render the seed more brittle, so that it may be easily crushed to powder; and secondly, to develope the aromatic oil, which corresponds to the volatile oil of tea.

Coffee contains three constituents similar to those of tea, viz. the white powder, which in this case is called

caffeine, the **tannic acid**, and the **aromatic oil** developed in roasting.

Its effects upon the human system are somewhat like those of tea; but it is said to be more stimulating, and it sometimes acts slightly upon the bowels. Its use at breakfast time is often found specially valuable to those who suffer from constipation. It also aids digestion. Hence on the Continent and in England it is taken after dinner.

If coffee is to be perfectly prepared for the table we should make sure that it is freshly roasted and finely ground, and then we should be careful to pour boiling water over it, our object being to extract the greatest amount of aroma in a liquid clear and free from grounds. The addition of hot boiled milk is a great improvement to coffee. The French excel in making coffee, and as a rule take **café au lait,** i. e. coffee with much hot milk.

It is said that the Arabs first learned the value of coffee from the Persians, who used it early in the ninth century. From Arabia it was introduced into Turkey, and coffee divans were established about 1550 in Constantinople. The beverage became exceedingly popular, until at last the Government tried to prevent the sale of it; but all in vain, for the Turks appreciated coffee, and were determined to have it. The trade continued as briskly as ever, but secretly, to escape the penalties of the law.

Coffee was first sold in London in 1652, and **coffee-houses** became important meeting houses of the time; as you may read in English history.

Chicory is commonly mixed with coffee to make the infusion darker and to give a fuller flavour, which some persons prefer. Tradesmen are, however, forbidden by law to mix chicory with coffee, unless desired to do so by the purchaser. The chicory or succory root, similar to that of the white carrot, is long and tapering. It is sliced and roasted until it becomes black and friable. It is extensively cultivated in some parts of England, but grows wild in many places, where its lovely blue flowers make the roadsides quite gay.

Cocoa is the produce of a tree which is a native of Central America. Opinions differed as regards its value when first introduced.

The celebrated botanist Linnæus called it **theobroma,** or "food for gods," while a traveller named Benzoni speaks of it as "only fit food for pigs." The latter's opinion has not affected the use of cocoa, and it can now be purchased in several forms, such as nib, rock, soluble, homœopathic or powder cocoa, or in the more delicately prepared and flavoured form of **chocolate.** The purest is the nib cocoa. Soluble and powdered forms are very frequently adulterated with sugar and starch, sago, flour, or arrowroot. Cocoa is really a food, because it contains a large quantity of fat called cocoa-butter. This, however, causes it to be somewhat indigestible, hence it does not suit everybody. Theobromine, as the white power is called, acts in the same way as the similar constituent of tea and coffee. The method of preparing cocoa for use varies according to the kind employed; thus if nibs, which are simply the crushed seeds, be used, they require boiling that the water may extract the flavour. With soluble or powdered preparations it is simply necessary to pour boiling water over a proper quantity, and thoroughly mix the two, adding milk and sugar to suit the taste. The effects of cocoa upon the nervous system are not so marked as those of tea and coffee.

LESSON XIII.

FERMENTED DRINKS.

DERIVATIONS.

Inhabitants.—Dwellers. *Lat.* **in**, and **hăbĭto**, to dwell.

Exported.—Sent to another county or country. *Lat.* **ex**, out, and **porto**, to carry.

Incalculable.—Enormous, very great. *Lat.* **in**, not, and **calcŭlo**, to compute, reckon.

Magistrates.—Those who administer the law. *Lat.* **magister**, master.

Ingredient.—One part of a mixture. *Lat.* **ingredior**, to go into.

Attractive.—Pleasant. *Lat.* **ad**, to, and **traho**, to draw.

Preternaturally.—Beyond what is right or natural. *Lat.* **præter**, beyond, and **natura**, nature.

PRONUNCIATION. Exercise on sounds of *Ī.*

by (near), iron, wire, while, mile, ice, arise, wise, wisdom, life, wife, five, knife, drive, wine, time, a stile, like, sigh, wide, to write.

Part I.

THERE can be no reasonable doubt that the purest and best drink is water. Water is necessary for both animal and vegetable life, and is quite capable of satisfying the thirst of men and women, boys and girls.

But nearly all nations, civilized and uncivilized, have learned to make drinks more pleasant to the taste than water, which when pure is tasteless. Such drinks are generally made by **fermentation.** The Latin word **fermento,** means to cause to rise, or swell up, to break up, or loosen. Dough is said to **rise** when yeast is mixed with it, and the Latin word for leaven, or for yeast, is **fermentum.** Fermentation is the process by which sweet vegetable infusions or juices are changed wholly or partly into solutions of **alcohol, ardent spirit**, or **spirit of wine.**

Alcohol is an Arabian word. Ardent spirit means burning spirit, from the Latin **ardeo**, to be on fire, to burn, to blaze. Pure spirit of wine is colourless, like water, but very much lighter and highly inflammable. It has a burning taste and a powerful odour. It receives the name spirit of wine because it is mostly obtained from wine by distillation; that is, the wine is heated in a still, and the spirit goes off in vapour; and before the watery part is hot enough to boil, the vapour is condensed into liquid, in cooling vessels, called retorts.

Alcohol readily mingles with water, and in almost any proportion. The two fluids have so strong an affinity, or inclination, for each other, that it is scarcely possible to procure the spirit free from water. Even in absolute alcohol there is 2 per cent. of water, and *proof spirit* contains much more. It is important to remember that alcohol is a complex substance, a product of wasting, or decomposition, and not of construction. Sugar is a product of construction or building up. But when sugar begins to be resolved into its elements, carbon, hydrogen, and oxygen, and some of the carbonic acid escapes, then, if the decomposition be arrested, the sugar becomes changed into alcohol.

All fermented drinks contain more or less of this spirit. The chief are beer, cider, wine, rum, whisky, gin, brandy.

Beer, in its various forms and qualities of pale ale, porter, stout, &c., is brewed from malt and hops. Porter and stout are made by slightly burning the malt, and mixing the wort with Spanish juice. Malt is barley which has been caused to germinate by being steeped in water, after which it is dried in a kiln. The germination turns the starch of the grain into sugar. It is on this account that barley, thus treated, is excellent food to fatten cattle, and is often used for that purpose. Pigs are fed on brewers' *grains*, but most of the nourishment has been taken from them in the brewing. Sugar, treacle, salt, tobacco, the berry of cocculus indicus, and other things are used to adulterate beer; and that is why ordinary public-house beer is so very unwholesome and intoxicating. The more a man drinks the more thirsty he becomes. Good beer taken in moderate quantities is a healthy, tonic, stimulating drink; which promotes digestion and increases the circulation. "Good hops impart to malt liquors a pleasant, bitter, aromatic flavour and tonic properties." Beer is also slightly soporific, or narcotic.

Hops are cultivated in Kent, Surrey, Worcestershire, Lancashire, Cheshire, and other counties, but those of Kent and Surrey are considered the best. Barley is grown in nearly all the agricultural counties of Great Britain, and is also imported largely from Canada and the northern countries of Europe.

We should always remember, however, that beer is a luxury and not a necessity. It contains about 90 per cent. of water, from 3 to 8 per cent. of alcohol, and about 5 per cent. of sugar, albumen, or gluten. Therefore the only really nourishing substance in it is the small quantity of glutinous and saccharine material.

"Beer is consequently a very extravagant and expensive kind of food, apart from all consideration as to what may be the nature and effect of the ardent spirit which is present in it. It has been ascertained that 2¼lb. of bread give as much strength and force to the human body as nine bottles of pale ale. But the 2¼ lb. of bread cost only 3½*d.*, whilst the nine bottles of pale ale cost 4*s.* 6*d.*"

When people say, therefore, that they cannot work without beer, you will understand what that means. They might as well say that they could not eat soup except with a gold spoon, or drink milk except out of a silver mug.

Cider is made from the expressed and fermented juice of apples, and **perry** from that of pears. A liquor made from the gross matter of apples after the best cider juice is pressed out is sometimes called ciderkin. Devonshire, Herefordshire, and some other counties in the west of England are noted for their cider orchards. Devonshire alone has 22,000 acres of such orchards, and cider is the common beverage of the inhabitants, and is also extensively exported to London and other places. Wages are sometimes partly paid in cider, which is a very bad custom and one that will soon be given up.

Wine is the fermented juice of the grape. It was given to "make glad the heart of man." We can grow grapes in England, but not in sufficient perfection and abundance to make wine; consequently we import very large quantities of it from France, Spain, and Portugal, and the Rhine countries. There are, indeed, a number of so-called home-made wines, which, unless they be heavily brandied, will not keep. Wine is a greater luxury than beer, but it is by no means a necessity, as it contains very little nourishing food substance.

Dr. Mann, in his 'Domestic Economy and Household Science,' says:—

> "The quantity is indeed so small as to be hardly worth consideration. The amount of ardent spirit, produced from the transformation of the sugar, is, on the other hand, much larger than in beer. There are three ounces and a half of ardent spirit in every pint of strong **Sherry** and **Port**; two ounces of spirit to the pint

in **Burgundy**; and one ounce and a half, or one ounce and three quarters, in the lighter wines, which are called **Champagne, Claret,** and **Hock.** The colour, fragrance, and flavour of wines depend upon very minute quantities of other ingredients which are extracted from the grape, and retained with the spirit in the liquid, after fermentation. It is to these flavouring matters that the agreeable quality of all wines is due. But the seductive power of fermented drinks, even in the case of wines which are the most attractive to the taste, unfortunately depends more upon the influence of their ardent spirit than upon these comparatively harmless ingredients."

Wines are mostly named from the countries where they are produced. Thus port is so called from Oporto, in Portugal; sherry from Xeres, in Spain. In Shakspeare's time it was called sherris sack, or simply sack, under which name it is largely eulogized by Falstaff. Champagne and Burgundy are so called from those provinces in France. Bordeaux, or claret as it is more often called, comes from the south-west of France. It is a well-known fact, that where the common drink of the people is the natural wine of the country, intoxication is extremely rare. Very large quantities of spirit are distilled in England, to be mixed with imported wine, in order to make it stronger.

Under the general name of **spirits** are included brandy, gin, rum, whisky, and some others.

Brandy is distilled from wine, and comes from the Loire region in France, and other places. The name brandy means literally **burnt wine.** It is actually called **brant wein** by the Germans; but **cognac,** or **eau de vie,** by the French. We have the same root in *brand-new,* which means new from the brand; a *brindled* cow, i. e. a cow which is marked with stripes which look as if they had been burnt. In Russia bad brandy is distilled from potatoes.

Gin is distilled from grain and flavoured with juniper berries and other substances. It is said to be so called from Geneva. Other names for it are Hollands, Old Tom, &c. It is a most seductive spirit, and is largely adulterated.

Rum is extracted from sugar by distillation, and comes chiefly from Brazil and the West Indies.

Whisky is distilled from wheat, and is the favourite spirit in Ireland and Scotland.

All these spirits are, in their purest form, nearly or quite white.. They are, however, coloured in order to distinguish them and make them sell better.

> "The amount of money that is spent every year for fermented drinks is almost too large to be believed, but it has been carefully estimated in figures. In Great Britain and Ireland alone, as much as 80,000,000 gallons of fiery alcohol are consumed every year in the various forms of fermented beverages. The value of the drinks thus consumed, in the British Islands, in a single year, is certainly more than 130,000,000*l*. of money. It thus costs the inhabitants of these islands, who are generally considered to be amongst the most civilized and intelligent of the nations of the earth, considerably more for their strong drink than it does for all the advantages of good government—police, the administration of justice, prisons and reformatories for offenders, and the army and navy for external defence all added to the list. Yet those who know best what the actual value of fermented drink is in supporting the strength of the body are quite aware that almost the whole of this vast sum is expended in waste, because a very small part indeed of it, spent in such materials as bread and meat, would really give more nourishment and strength than the spirit can by any possibility furnish. There is also the still more sad knowledge that a very large quantity of the strong drink is consumed, not only to no good purpose, but to a very bad and a very hurtful one, as at once appears when the direct influence of the strong spirit upon the organs of the living body is taken into account."—*Dr. Mann.*

It is to be hoped that everyone who reads these lessons will remember what she reads, so as not only to avoid herself, but also to lead all whom she can influence to avoid excess in drink. The amount of sin and misery, poverty and distress, hunger, disease, and death, caused by drunkenness is incalculable. A man drunk is a disgusting and loathsome sight, but to see a woman drunk is enough to make any one weep for shame and sorrow. If people be in distress, if they have nothing to eat, if man or woman have committed a crime, if the children have no shoes or decent clothes, and we ask why?—the answer is generally in one word—*drink.*

Part II.

CHILDREN are sometimes joined together in societies called **Bands of Hope, Good Templars,** &c., and adults in what are called **Teetotal Societies,** which require those who enter them to sign a **pledge** that they will abstain entirely from intoxicating liquors. These are all excellent in their way. But it is the duty of everyone to abstain from evil for a higher reason than the constraint of a pledge. All excessive drinking, as well as excessive eating, is evil. It is a sort of sacrilege, a robbing God, because it destroys and wastes, perverts God's good gifts, and changes blessings into curses. The use of all these things, beer and cider, wine and spirits, is good enough; it is the abuse of them which is sin.

Dr. Mann, from whose book we have already quoted, has studied these subjects very much, and has written two chapters which all ought to read. They are called—

1. The Intoxicating Power of Fermented Drink (Lesson XXXIV. p. 181), and
2. The Food-power of Ardent Spirit (Lesson XXXV. p. 187).

He has given permission to the writer of these lessons to make extracts.

All know that excessive drinking produces intoxication. The Latin word *toxicum* means a venom or poison, in which arrows were dipped. So the word intoxication itself tells us what is the actual fact, viz. that it is a species of slow poisoning. Those who habitually get drunk, not unfrequently die at length of an awful disease called *delirium tremens*, which means trembling madness, and is too dreadful to write about. It is well known that persons commit wickednesses when they are wholly or partly drunk, which they would not do at other times. But the magistrates wisely do not accept any such excuse. Drunkenness itself is a punishable crime, and everybody ought to know that those who sell more drink to those who are already partly tipsy, are also punishable. In fact those who sell deserve the severer punishment. The children of drunken parents are almost always weak and sickly, afflicted with lameness, diseases of various kinds, and frequently die of consumption.

You shall now read what Dr. Mann says about some of these things :—

> "When only a moderate quantity of ardent spirits is mingled with the water, as is the case in beer and the weaker wines, the spirit goes with the water into the blood. The water, spirit, and blood are then circulated together through the textures of the body. In other words, the spirit, as well as the blood, is flushed to all the interior recesses of the frame, to the flesh, to the nerves, and to the brain, and is kept streaming on round and round through them. The purifying organs of the body immediately become conscious of the presence of the unnatural spirituous ingredient in the blood, and begin to clear it away with the other waste and useless substances as fast as they can. Some part of it is distilled away out of the mouth with the breath, some is exhaled through

the pores of the skin, some is removed with the liquid excretion of the kidney, and with the bile, and some part is broken up in the blood, into its final elements, oxygen, hydrogen, and carbon. It takes some time to accomplish the clearance, but the whole is certainly removed, if the quantity which has been taken is not more than the purifying organs can grapple with.

"The first organ to suffer is the one which is the most beautifully and delicately organized of the whole, the organ, namely, which is concerned in the production of feeling and thought, and which is called the brain. The brain consists of a soft pulp, permeated everywhere by capillary vessels, which bring to it its proper supply of blood. The brain, indeed, is so active and important an organ in the human being, that it has much more abundant blood-vessels, and receives a much larger amount of blood than any other part of the frame of the same size. When the blood which comes to its pulp through the branching blood-vessels in this abundant way, is highly charged with ardent spirit, the brain soon begins to lose its proper powers. First there is confusion of thought, for thought is one of the proper functions of the brain; then there is indistinctness of speech; and after that, loss of the power both of feeling and movement, so that the individual falls insensible to the ground. The state which is thus produced by the action of burning spirit upon the brain, is very aptly called intoxication.

"It is a very remarkable fact that, although ardent spirit burns when it is set light to in the presence of air, and furnishes a hot flame, it does not appear to have any actual heating power when it has been received into the blood. The portion dismissed through the mouth and skin as spirituous vapour, and through the liver and kidneys as liquid spirit, would of course yield no heat, because that portion is not burned. But it might very reasonably be expected that the part which is split up in the blood into its original elements might furnish some warmth. The opposite, however, seems to be the fact. The bodies of drunken men grow colder instead of warmer, from the presence of the intoxicating spirit in the blood. In certain kinds of fever physicians employ alcohol as a medicine, because it reduces the heat of the sufferer, and makes the parched body cooler. The feeling of warmth which follows when people drink a little spirit, wine, or beer on a cold day, appears to be due simply to the increased circulation of the blood that it causes, and not to a true oxidation, or burning of the spirit. When the blood flows more quickly through the various structures of the body, through the lungs, as well as the rest, other ingredients of the blood, such as the oil, sugar, and bile, are for a short time more rapidly consumed with the production of increase of warmth.

"This effect, however, only lasts for a brief interval, and it is invariably found that the blood of persons who indulge habitually in strong drink becomes preternaturally dark from the accumulation within it of various carbonaceous matters which ought to be removed."

As to whether there is any real **food-power** in beer, wine, or spirits, which ought to be what people mean, when they say that such drinks do them good, he says:—

"The opinions of scientific men differ as to what is the probable truth in regard to this particular point. Some believe that the spirituous part of fermented drinks does nourish and strengthen the body when they are judiciously and moderately employed; and that ardent spirit is, in itself, properly a food, as much at least as oil, sugar, and starch. Others, on the contrary, as fully believe, and strenuously maintain, that ardent spirit is in no sense a food; but at the very best, and when employed only in quantities too small to be capable of doing harm, is merely waste and useless substance that has to be got rid of. Both of these differing authorities have apparently good reasons to give for the opinions they hold. Thus, it is certain that old people have been known, in some extreme cases of illness or of confirmed habits of intemperance, to live for weeks at a time upon spirituous drink, without suffering any loss in the weight of their bodies, such as would certainly have occurred if they had remained entirely without food for the same period; and again, in cases of extreme weakness, and the exhaustion of severe fever of a certain kind, sick people are often kept alive by strong drink given as a medicine by their doctors.

"On the other hand, it appears at the first glance inconsistent with the general order of nature's plans that alcohol should serve as a food, because it is a substance advancing towards decomposition and decay, and not one in the completeness of elaborate complexity, as all the proper food-substances are. Alcohol is a compound already corroded by the tooth of the wasting oxygen, and therefore, in this sense, unsuited to play the part of a food to the animal body. The rule of nature is that food-substances are complex bodies built up out of simpler elements, by the powers of vegetable life, in order that sustenance and strength may be obtained from them when they are pulled to pieces or resolved in the animal frame. Alcohol is clearly not a substance built up out of simpler elements, but a substance of this class that has been broken down into a simpler state, and that is advancing to the condition of further decay.

"So long as there remains any shadow of a doubt as regards its usefulness in the system, it must be the part of a wise ordering of the habits, as well as of a sound economy, to secure the benefit of the doubt, and to regard fermented drink as a thing to be avoided rather than sought. One of the best exercises in self-denial and self-control that can be conceived is the habitual abstinence from strong drink because it is known to be a dangerous agent to toy with, and because it is not known that even its most moderate consumption is an unalloyed good.

"But if this be the true state of the case the keeping of so suspicious an influence and so seductive an enemy out of the hands of young people and children, becomes of even more momentous importance than that grown people should resist the temptation. **To give strong drink to children,** who can know nothing about these reasons for its avoidance, **is a most cruel act.** It is nearly certain to result in setting up the dangerous and almost irresistible craving, before any power of self-control can have been established. Very few children, who have been used to beer and wine in their tenderest years will ever be able to lay them aside in maturer life. Many cases of incurable intemperance can be distinctly traced to habits quite innocently and unconsciously acquired in early childhood. It is almost a rule with children that they dislike beer and wine when they first take them; but after they have been induced to drink them a few times, they begin to like them, and then, after a while, cannot do without them. It is certainly a maxim of the soundest domestic economy to see that no child ever has beer, wine, or spirituous liquor of any kind placed within its reach."

NOTE.

The Revenue derived from Spirits, &c., in England, Scotland, and Ireland.—A Parliamentary return obtained by Mr. M'Laren has been issued, showing the proportions of the duties on spirits, malt, wine, and tobacco which were chargeable against England, Scotland, and Ireland respectively for the year ended March 31, 1877, and also the net produce of the other sources of revenue derived from taxation, divided between England, Scotland, and Ireland respectively. From the first-named class of duties the revenue obtained was: England, 29,734,441*l.*; Scotland, 5,434,169*l.*; Ireland, 5,360,112*l.* From the other sources of revenue the amounts obtained were: England, 21,367,449*l.*; Scotland, 2,323,044*l.*; Ireland, 1,304,612*l.* This is exclusive of the revenue from the Post Office and Telegraph Service, respecting which information cannot be furnished for England, Scotland, and Ireland separately.

LESSON XIV.

SUGAR, TREACLE, AND HONEY.

DERIVATIONS.

Acquired.—Gained. *Lat.* **ac-quīro**, to obtain.
Introduced.—Brought into notice. *Lat.* **intrō-dūco**, to bring in
Originally.—At the beginning. *Lat.* **orīgo**, source.
Succession.—Following in order. *Lat.* **suc-cedo**, to follow.
Deprived.—Despoiled. *Lat.* **prīvātĭo**, a taking away.
Centrifugal.—Flying from the centre. *Lat.* **centrum**, a point in the middle of a circle or sphere.
Percolating.—Filtering through. *Lat.* **percōlātĭo**, a straining.
Saccharine.—Sugary. *Lat.* **sacchărum**, a sweet juice, sugar.
Clarified.—Made clear. *Lat.* **clārus**, clear.
Spontaneously.—Freely, of one's own accord. *Lat.* **sponte**, willingly, voluntarily.

PRONUNCIATION. Exercise on sounds of *I* and *U* in

busy, trust, think, sin, din, mind, kind, ridge, a lie, unfledged, midge, dry, to buy, a bridge, much, vixen, did, little, pit.

IN different forms and in various proportions, sugar is widely distributed in the vegetable kingdom. It is a component of the stem and leaf juices of some plants, it is found in the fruit of others, and in nearly all edible seeds. The sugar used in France, Belgium, Germany, and Russia is obtained from **beetroot**, and it is said that there are as many as from 2000 to 3000 factories for its preparation on the Continent.

In India and China the great source of supply is the sap of the cocoa-nut palm; while the inhabitants of the north of the United States of America, and the adjacent districts of Canada, make their sugar from the juice of the **sugar maple**, as no doubt you have heard before. These are all excellent in their way, and are valuable as furnishing means of promoting native industry, but none of them can compete with **cane sugar**, which is the most perfect form of sugar at present known. You are quite familiar with its appearance and taste, for it is used daily in every English household. But though sugar is now regarded as a positive necessary of life, and is so cheap that it can be easily procured even by the poorest persons, yet up to the end of the last century it was an expensive luxury, and was only within the reach of the wealthy.

The Crusaders acquired a taste for it while they were in the East, and on their return home introduced it into Northern Europe. It was well known to the people of Southern Europe long before that time, for the Saracens brought cuttings of the cane westwards, and the plant spread from Spain to Portugal and the Canary Islands.

On his second journey, Columbus carried some canes to the West Indies, and these islands have ever since ranked as one of the chief sugar-producing countries of the world.

The sugar cane can be almost universally grown in hot or tropical countries. Being originally a bog plant, it flourishes best in moist situations, as in the lowlands of the Mississippi, the West Indies, Bermudas, Mauritius, Java, parts of Hindostan and Brazil.

Within the tropics the roots will continue to throw up canes for twelve or even fifteen years, but near the north or south limit of the sugar-producing zone, where the climate is less favourable, they are exhausted in a single season. Like all plants of the grass family, the sugar cane is composed of a succession of joints, and in the intervals between them are numbers of cells containing the saccharine juice which we value so much.

The sugar cane is a beautiful plant, growing to a height of from 8 to 12 feet, and measuring at the base 2 inches in diameter. As it matures, it gradually assumes a bright golden colour, much like that of ripe wheat, while those parts most exposed to the sun become beautifully streaked with red. The top of the cane, at first dark green, subsequently puts on a russet hue, and it is clothed with long, narrow, curving leaves. From the centre of this leaf-tuft, rises a silvery shoot, crowned with a plume of white feathers, fringed with lilac. You may imagine, therefore, that a plantation of ripe sugar canes forms a really beautiful sight.

The juice is richest and most abundant in the lower part of the stem, so the canes are cut down with sharp knives near to the ground, in order to secure it. The tops are chopped off and left as refuse, and the canes are removed to the factory to be deprived of their sweet juice.

The manufacture of sugar requires great care and skill, and the machines now employed are both ingenious and expensive, though the process itself is simple. The canes are first crushed between revolving rollers, then the juice is heated and lime water is added. The lime serves two purposes: first, it destroys the acid which rapidly forms in the fresh juice, and, second, it unites with the gluten, causing it to settle at the bottom, and thus prevents it from turning the sugar acid. The juice is then boiled until it becomes a thick syrup, and the impurities rising to the surface are constantly skimmed off. Even the scum is not wasted, however, but is used in the distillation of rum, while the exhausted canes serve as fuel for the boiling house.

The juice is then poured into vessels to cool, and the more gradual this process, the larger will be the crystals, and the better the sugar, for all domestic purposes. Formerly the sugar was taken from the coolers and packed in casks with perforated bottoms, through which the **molasses** or coarse treacle drained. The method generally adopted now, however, greatly economizes time and labour; it is this:—

After the juice has been boiled it is passed through bag filters and animal charcoal; and vacuum pans are used to evaporate the surplus moisture. Then the molasses are separated by a *centrifugal* machine, thus: The sugar is put into a drum made of fine wire gauze, and this being made to revolve very quickly, the syrup is thrown through the meshes while the sugar is retained inside.

This is the raw moist sugar which we receive from our colonies.

Some foreign countries carry the cleansing of their sugar a little further by the use of the *clay* process. In this case the sugar is put into huge earthenware moulds, and over the top of each a layer of very moist clay is placed. The water from the clay gradually percolating through the sugar, washes off some of the molasses that still cling to the crystals, and then escapes through a hole in the bottom left for that purpose. This is known as *clayed sugar*.

Raw or brown sugar is the best for sweetening; but as refined sugar is more agreeable both to the eye and to the taste, we further purify it after we have imported it; and there are factories for this purpose in several of our large towns, especially London and Bristol. The purification is effected in this way. The raw sugar is dissolved in great tanks with hot water, and bullocks' blood is stirred into it. Then, as the temperature of the mixture is increased, the albumen of the blood coagulates and rises to the surface, bringing with it most of the impurity of the sugar. This is skimmed off, and when the fluid has been filtered through charcoal, and the moisture partly removed by evaporation, the sugar is then put into moulds, still further dried, and is thus shaped into the sugar-loaves which you see in the grocers' shops.

A hundred pounds of raw will yield about eighty-five pounds of refined sugar. Sugar is a very valuable and economic article of food, and as it is both nutritious and digestible, moist sugar at least should enter into the daily diet of everybody, but particularly of children.

Some persons think it is cheapest to buy coarse sugars, but this is very questionable, for they often retain great quantities of impurity, as the microscope will reveal, and adulteration is confined to them.

You will be wise not to buy dark, damp, small-grained sugar, for it is very inferior, and is often wrapped in coarse porous paper to absorb its superfluous moisture. Good moist sugar is light in colour, quite dry, highly crystallized, and almost free from smell. Good moist brown sugar sweetens tarts or coffee better than white sugar, whether in powder or in loaves; but lump sugar is preferred for tea

Treacle is the uncrystallizable portion of the saccharine juice, from which the sugar has been separated. There would always be some, but the relative proportion of treacle is greatly increased by the application of heat in the present mode of manufacturing sugar. Treacle is nearly as useful as sugar for sweetening purposes to persons who do not object to its peculiar flavour. It is exceedingly wholesome, and may with great advantage be spread on bread, as a substitute for butter; or used in puddings for children. *Golden syrup* is a similar production, yielded during the refining of moist sugar. It is clearer and much lighter in colour than treacle, and its sweetening properties are inferior, though it is sold at a higher price.

But we must not close our chapter on sweets without a few words about **honey,** for which we are indebted to the active industry of the working bee. Perhaps you have watched this busy little insect flying from flower to flower, collecting the honey which it stores in a little bag attached to its own body. When this is full the bee carries it home, and deposits tho honey in a hive for future use. Very likely you know that a hive contains several *combs* made of wax. These are beautifully constructed, being composed of hexagonal cells exquisitely fitted together by their sides. When the combs are full the bees close them with wax, to seal up the honey until it is wanted.

You may like to know that if bees were fed on sugar, it would take twelve or fourteen pounds, to enable them to secrete one pound of honey.

In the country many of our cottagers' wives keep bees, and are very proud of their honey. A single hive will yield from twenty to forty pounds annually; and by the sale of her honey, if she have several hives, a thrifty housewife will often contrive to pay the rent of her little cottage, and dress her children neatly and nicely too.

Virgin honey is that which flows freely from the comb, either spontaneously or with the application of gentle heat. This is the purest and sweetest of all. The rest is extracted by increased heat and by pressure, and is afterwards clarified.

When it has been kept for some time, honey becomes thick, and looks like a solid crystalline mass. It has then lost much both of its richness and flavour. But in its fresh state it is very agreeable to most children when spread on bread, and it is considered a good remedy for sore throats.

It is to be hoped that you remember the story of **Bessy's Bees** in Standard IV., as it tells you more about honey than we have room for here. There are also some interesting Lessons on Bees in Standard II., and a picture of honeycomb at page 154.

§ 2. CLOTHING AND ITS MATERIALS.

LESSON XV.

SOURCE OF ANIMAL HEAT, ACTIVITY, AND POWER.

DERIVATIONS.

Viz.—Contracted from **videlicet**, namely.
Amyloid.—Starchy. *Lat.* and *Gr.* **amylum**, starch.
Artificial.—Made by man. *Lat.* **ars**, skill, and **facio**, to make.
Conveyed.—Carried, taken. *Lat.* **con**, together, **veho**, to carry.
Evolved.—Given off. *Lat.* **e**, out, and **volvo**, to roll.
Furnace.—A huge closed fire. *Lat.* **furnus**, an oven.
Production.—Anything made, grown. *Lat.* **produco**, to lead or bring forth.
Functions.—Offices. *Lat.* **fungor**, to perform, **functio**, a performing.
Phenomena (sing. phenomenon).—*Gr.* for appearances.

PRONUNCIATION. Exercise on sound of Ȳ.
sky, why? hire, fire, lice, mice.
(Guard against the vulgar *oi*, as in *skoi*, &c.)

YOU will remember that in Lesson I. food-substances were divided into two classes, according to the operations they perform in the human body, viz.:—

1. **Heat-givers,** or Supporters of Respiration, which are also called carbonaceous or amyloid food-substances.

2. **Flesh-formers,** or Supporters of Nutrition, called also nitrogenous or azotized food-substances. Azote is, as you know, another name for nitrogen, which was so called at first, because it would not support either life or combustion.

In the lesson on Heat, we spoke of natural and artificial heat, the former derived from the sun, the latter from fires. But the heat of our own bodies is also natural, and although very different in many points from the heat of a fire or a stove, yet it is in other respects very much like that heat. In fires we burn coal or coke. In our bodies we burn carbonaceous food. And just as burning in the fire is the mingling of the carbon with the oxygen of the air, so the burning up of the waste matters of the body is performed by mixing them with the oxygen in the blood. The oxygen, as you know is taken into the lungs with the breath, is there taken up by the little red corpuscles of the blood, and thence carried to all parts of the body. In those parts it is given up to produce the burning of the carbonaceous and other waste parts of the textures. The carbonic acid which results from this burning, is conveyed back to the lungs in the serous liquid of the blood, and discharged into the air with each expiration.

When carbon combines with oxygen to make carbonic acid, heat is evolved. This is the chemical way of expressing what we mean when we say that the fire gives off heat, and that food enables us to keep warm. About 5000 grains of carbon must be added to the blood every day, in order that the proper heat of the body may be kept up. Perhaps some of you have seen a blast furnace in which iron is melted. Those who have not seen one, know that iron is smelted, (to use the technical term) by putting it into a closed furnace, with large quantities of coal and limestone. The fire is then blown into a fierce white heat, by means of hot air forced into it by huge bellows. Blast furnaces for iron require, of course, many tons of coal a day. This is exactly what is done every day in your own bodies.

Each girl is a sort of little furnace, making her own heat as she wants it, and consuming it by running about, working, and so on. About half a pound of carbon is burnt in the blood of an adult in twenty-four hours; and therefore not quite so much in that of a girl. Every adult human being must burn this half-pound of carbon every day, and requires no less than 90 cubic feet or 8 pounds of air, in order to furnish the requisite amount of oxygen.

You will perhaps smile at this odd idea of each one of you being a little furnace. But you see you get your heat in the same way as a fire does; and as you can warm yourself at a fire, so, if you had been running, or playing, and making your hands glow, you could very easily warm those of one of your play-companions by taking them between yours. You would give some of your heat to her, just as the fire does to you. Things feel cold to us when they are taking heat away from us. If they be of the same temperature as our bodies, we do not know that they are either hot or cold, we may not even be conscious that we touch them. Things are hotter than our bodies when we receive heat from them.

You are all aware that you become hotter if you run about, than if you merely walk or stand still. This is because you then consume more carbon, and consequently make more heat. Sometimes, in very cold weather, the hands become quite numb, and may look as if they were dead, and really have no feeling in them. This is because the blood is not moving freely in them. There is little burning up of waste matter going on, and consequently little production of heat. If you clap your hands together sharply for a short time, they will soon begin to tingle, which shows that the blood is moving more quickly. You can feel at first each little pricking that goes on; and if the hands have been very cold and very numb, this quickened motion will at first be almost painful. Then the little fiery prickles come on faster and faster, until you cannot distinguish them, and your hands become quite hot. The pricking sensation is due to a peculiar influence of the moving blood upon the nerve fibrils (i.e. very minute nerves), following stagnation of blood from cold. If you make them still hotter, waste will be burnt up faster, and some of the heat driven off as perspiration. If they were left alone when numb, until they became actually frozen, as they do occasionally from exposure in the Arctic Regions, then the flesh would be actually killed, and if not removed would mortify and drop off.

Chilblains are caused by allowing any part of the hand or foot to be numb too long, and then warming it too fast at the fire. They are also caused on the hands by not drying them well after washing.

You will find on referring to the Thermometer, that what is called **blood-heat,** i.e. the proper temperature of the blood in order that it may carry on the vital functions properly, is 98° Fahrenheit. The blood never becomes much hotter than this, except in fevers, because perspiration enables it to part with excessive heat.

We usually say that our clothes keep us warm, but there is no warmth in the clothes. All the heat is in the body, and we wear clothes to prevent the heat escaping from us faster than we can make a fresh supply. If it do escape faster we feel chill and take cold; so whenever you begin to feel so, run about at once, if you can; or if not, breathe faster, get into a warm place, or put on more clothes.

All people have work of some sort to do. The laziest have to carry about their own bodies. If the other girls try to carry the tallest girl in the class, they will see that even carrying about the body means work. This power to labour is obtained from the food.

It is well known that Englishmen can do more hard bodily work than men of almost any other country, and the reason is that they live better. If a great deal of work be required of a steam-engine, it must be made very strong, and supplied with plenty of coke and water. If a horse have very hard work it must have plenty of oats. If very much work be required of a man, he must be strong and healthy, and have plenty of wholesome food and drink.

Part of the food that we eat goes, as we have seen, to keep up the heat of the body. Part goes to keep up muscular motion, whether voluntarily, as in work, or involuntarily, as in the movements connected with the phenomena of life, of which we have already spoken.

Those that work much, must have their muscles hard and strong, and it is not likely that such persons will have too much fatty matter.

It is usual to measure work in what are called foot-pounds. Thus, if any one of you lift a pound weight from the table one foot, she has performed one unit of work, or in other words, a foot-pound. If a ton be lifted one foot, 2240 units of work, or foot-pounds, are done. You have perhaps heard it said that an engine was of so many horse-power. Now, a horse-power means, of course, as much as a horse can do; but as there are so many different sorts of horses, it is usually said that a horse-power is 33,000 foot-pounds.

We can now give you some idea of the vast amount of work done in the vital functions of the human body.

Dr. Mann shall tell you about it (pp. 209, 210):—

"The heart of a man beats something more than one hundred thousand times in twenty-four hours, to drive some twenty pounds of blood fourteen hundred times through the textures of the frame. The muscular effort which is exerted by the fibres of the heart to accomplish this circulation of the blood for twenty-four hours, if employed for lifting a weight instead of merely pumping a liquid, would be able to lift 121 tons of heavy material one foot high. The muscular movement, which produces the action of breathing, if applied in a similar way, would also lift eleven tons one foot high. The heat which is developed in twenty-four hours in a human body of average strength and size, if employed as mechanical power, as it would be, for instance, if made to generate steam out of water in a steam-engine, would be able to lift, according to some good authorities, nearly 3180 tons one foot high.

"The external work which can be done by a man of average strength, that is, by walking about, digging the ground, or hammering iron, amounts to a force, which, if employed in a different way, would be able to lift 350 tons one foot high. It will thus appear that the external work which is got out of a human machine from the consumption of its food is but a small fraction compared with the work which is devoted to the internal actions of life, and to the warming of the frame. It is, indeed, only as about one to nine. The amount of force which is expended in mere mental work, that is, in the work of the brain, is not easily estimated. But for all practical purposes it may be considered that the force capable of lifting 350 tons one foot high every twenty-four hours is practically divided between external work and mental labour, and that for this reason people are seldom able to perform both well."

LESSON XVI.

NECESSITY FOR CLOTHING.
THE DUTY OF GIRLS TO BE NEAT AND TIDY.

DERIVATIONS.

Climate.—The weather of any country. *Gr.* **klīma,** climate.

Essential.—That which cannot be done without. *Lat.* **essentia.**

Adapted.—Fitted. *Lat.* **ad,** to, and **apto,** to fit.

Preceding.—Going before. *Lat.* **præ,** before, and **cedo,** to go.

Expense.—Cost. *Lat.* **ex,** out, and **pendo,** to weigh, because money was formerly weighed; (cf. Abraham weighed to Ephron the silver. Gen. xxiii. 16).

Scrupulously.—With exactitude and attention. *Lat.* **scrupulōse,** carefully.

Sumptuary.—Relating to expense in dress. *Lat.* **sumptus,** expense, cost, charge.

Harmonize.—Agree, go together well. *Lat.* **harmŏnĭă,** agreement of sounds, and hence of colours, &c.

PRONUNCIATION. Exercise on sounds of *E*, *EA*, *E*.

merry, mirth, to thrash (corn), to yearn, elm, leather, wether (sheep), cress, besom (broom), weave, fever, speak, break, next, knead.

No one requires to be told that it is necessary to wear clothes. Every girl ought also to know, that in a changeable climate like ours, everyone, small and great, young and old, should wear good flannel next the skin all the year round. Unfortunately, what we are often too apt to consider unnecessary, turns out, on inquiry, to be that very thing which it is most essential for us to do. Animals, such as sheep and cows, horses and asses, dogs and cats, are born with wool, hair, or fur, on their skins, sufficient to keep them warm. Therefore they require no clothing beyond that with which nature has provided them. Little birds, chickens, ducklings, and goslings, are nearly naked when they come out of their shells; but down soon grows over their bodies, to be quickly followed by feathers, and they also are naturally clothed. Animals and birds, therefore, literally have to take no thought about their clothing; but man, who is born helpless and naked, has to prepare and make his own clothing, suitable to the climate of the country in which he lives, and adapted to the work which he may have to perform. He has to take thought about his clothing.

In the preceding lesson, on the source of animal heat, we found that all the heat of the body comes from the burning up of the food-substances taken into it and well digested; and more especially of those substances called heat-givers. Some people think we wear clothes to give us warmth. But you have now learnt that this is a mistake; we wear clothes, not to give us warmth, but to keep us warm, by retaining the heat which the healthy body makes for itself to enable it to work, whether with brain or muscle, with head or hand. Those parts of the body in immediate contact with the cold air, part with their heat faster than it can be supplied to them by the blood, and soon become chilled and cold. This you all know well enough by your own experience on a cold winter day. Hands, ears, and faces soon tell us what sort of weather it is. It does not matter very much about these parts, because they soon become warm again when we come into the house out of the cold air, often indeed warmer than the rest of the body. People who remain indoors on cold days, always complain more about the cold, than those who bravely go out. We see them sometimes shivering near the fire, wrapped up in a large shawl, vainly trying to get warm. They are cold because their blood does not circulate well. so they should go out and get it thoroughly oxygenated.

The chief object of clothing, then, is to prevent the escape of animal heat, or as we say, to keep us warm. But "if only to go warm were gorgeous," as poor old mad King Lear says, then we might wrap up ourselves in sufficiently large and accommodating pieces of blanket and we should be clothed. You smile at the absurdity of such a thought. Clothing has therefore another object, which is to make our bodies neat and tidy—beautiful too, as far as may be. Beautiful things are better to look upon than ugly ones; nay, we may say that beautiful things have more of God in them than ugly ones. "Behold, it was very good," was the mark of all His work.

It is the duty of girls especially to be neat and clean, tidy and nice in their dress, as far as they can. They ought also to see that their brothers are kept neat and tidy in their clothes, for every woman worthy the name of woman will know how to use her needle well. It is the duty of women to keep not only their own, but their husbands' and children's clothes scrupulously clean, and well mended. "A stitch in time saves nine," will be on the tongue of a good housewife as soon as she sees a small hole, and then at once out will come the needle and thread.

But although it is the duty of girls to be, and look beautiful in themselves and in their dress, they will never do so if they think too much about it. Self-consciousness spoils all looks. And it is in this respect especially that they should not take much thought about their dress. Having had it made of the best and most suitable material, of the best cut, pattern, and fit, having put it on with sufficient care and no waste of time, that is enough; and no more care or thought should or need be given to it. It must of course be suitable to station and work. There is a proper division of dress into Sunday and work-day—and of the latter, for dirty and clean work.

Once it was not lawful for women, unless they were ladies born, to wear clothes made of certain materials, as silk, satin, velvet, and so on. Such laws were called sumptuary laws, and many of them were very strange, others amusing, and some most absurd. But all these have long been done away. The best sumptuary law as to dress, is good sense. Some taste and skill is required in the arranging of colours; and those who have not much taste, or do not know the laws of colour sufficiently to harmonize or contrast them properly, should keep to quiet-hued stuffs. No person is ever well dressed who is stared at, or whispered about when she passes.

You will read in other lessons advice on the subject of what materials to buy and wear, and we hope that you will not forget what you read, but will show your good sense by putting it in practice. Remember, it is very easy to read a great deal of good advice and forget it all, and to act as if you knew a great deal better than your elders and betters; which of course you do not, however much you may really know.

As a rule you should not buy made-up clothing. Every woman ought to know how to make her own and her children's garments. Woven stockings are not nearly so warm, so lasting, so pleasant to the feet, or so proper to do much walking in as knitted ones. Therefore every girl ought to know how to knit stockings. Crochet work is very pretty play, but it is not of so much use. If you can knit first-rate, learn to crochet by all means; but if you cannot, learn to knit first. Ability to knit well is worth more than all the crochet work and tatting in the world, and all other **fancy** work, as it is well enough called. These come very well after knitting. Let your maxim be useful things first; pleasant, or playing ones next.

And above all, never be of those foolish ones who waste their money on gaudy ribbons, fine bonnets, cheap bargains, and stupid finery. They are jays, with peacock's feathers.

LESSON XVII.

IMPORTANCE OF NEEDLEWORK AND KNITTING.

DERIVATIONS.

Attractive.—Inviting. *Lat.* **attractĭo**, a drawing together.
Inestimable.—Above all price. *Lat.* **in**, not, and **æstĭmo**, to be valued.
Emulate.—To excel. *Lat.* **æmŭlātĭo**, rivalry.
Deftly.—Skilfully. *A.-Sax.* **dæft**, meet, fit.
Garments.—Clothing. *Fr.* **garnir**, to prepare.
Tedious.—Tiring. *Lat.* **tædĭum**, weariness.
Ambitious.—Having a desire to excel. *Lat.* **ambĭtĭo**, a striving for praise.
Minister (*v.*).—To supply. *Lat.* **mĭnistro**, to wait upon.

PRONUNCIATION. Exercise on various vowel sounds in

light, fight, star, far, earth, hearth, farthing, to starve, earnest, to learn, work, sword, yolk, beneath, heaven, seven, beyond.

THE title of this lesson may, perhaps, sound less attractive to you than those of some others. In point of fact, however, it ought to be most interesting, for excellence in needlework is an attainment which every girl, whatever her rank in life, should strive to possess. Ability to use the needle skilfully and well, is an accomplishment of inestimable value worthy your best and most earnest endeavours to acquire.

Do not forget this, and then you will not fall into the too common error of ignorant persons, who imagine that needlework is quite inferior, and fit only to furnish occupation for the very poor, for those who have to earn their living by it, or to afford amusement to persons of limited intellectual capacity. This is a great mistake, for without ability to use her needle well, no girl or woman can thoroughly fulfil her daily duties as daughter, sister, wife, or mother. With it, she can always be helpful, and sometimes independent.

Of course it is not necessary that rich persons should do their own needlework; yet even they should have such a practical acquaintance with it, as will enable them to direct others, and also to judge fairly of the work done by those whom they employ. And reverses sometimes come even to the wealthiest. Perhaps you have heard or read stories of ladies, who at such times found their knowledge of needlework a truly valuable possession, because it enabled them to make and repair their own garments and those of others dependent upon them. Thus, if they did not actually earn money by it, at any rate they saved the expenditure of many pounds.

But if the power to use a needle well and quickly be advantageous to persons in easy circumstances, it is a tenfold boon to the poor; helping them by thrift, and patient industry, to make their earnings go much further than they otherwise would. Some of us have occasionally been astonished to see how cleverly the mother of a large family manages to keep all her children neat and tidy, and her household free from rags and tatters. This is by no means an easy task, for it is surprising how soon things get out of order, and what watchful attention is necessary to keep them in repair. Without inquiry we know that such a woman is expert with her needle, and that it is by its active use, together with the exercise of great patience, industry, and self-denial, that she accomplishes so much. She finds her reward in the increased comfort and respectability of all around her.

She not unfrequently presents a marvellous contrast to a near neighbour, who, ignorant of the art of needlework, and unable to manage without it, is always slatternly and untidy;—possibly envious, too, of the appearance of the thrifty one, without being in the least anxious to emulate her in the right way.

All persons, but especially children, need often reminding that buttons, tapes, and loops, are always coming off, and that the best way is to sew them on again at once. It is the worst possible plan to leave the task for a future occasion; for then most likely the garments will be worn again without them, giving the wearer an untidy appearance and teaching her when it is almost too late that "A stitch in time saves nine," or we might say, nine hundred and ninety-nine. It is well for us all to learn betimes to make our underclothing out of new materials; but we ought never to lose sight of the fact that it is proof of far higher skill to be able to alter and mend them perfectly when they are old. Probably it is for this reason that we find that many persons can make new things tolerably, who have little notion how to repair them.

You all know that the first step in the art of needlework is to learn the elementary stitches, such as sewing, hemming, running, and others; but as you are now in Standard V. you ought to do these thoroughly, as well as to fix your own work. Some of you may also be able to cut out a few simple garments from the patterns. But it requires much careful attention and practice to do this economically. Cutting out is too important a branch of needlework to be thus summarily disposed of, so we intend devoting another lesson to it.

But before beginning any needlework always see that your hands are perfectly clean, for however neatly you may do the actual stitches, if a garment be soiled in the making, its whole appearance is quite spoilt. Many little needlewomen are apt to forget this. Never unduly hurry over your work, but fix it carefully, and make the necessary turns deftly, so as to cause all the parts to fit exactly. Then tack it lightly together. It is by no means uncommon for young beginners to imagine, that it is waste of time to tack work in place, before it is actually sewn. But older, wiser, and more experienced persons, know well, that it really is a great saving of time. And children, who are so silly as to object to the trouble of tacking, often pay the penalty, by having to pick out again much of what they have done. Try also to become expert in selecting suitable needles and cotton, and in using the stitches best adapted for the different kinds of material you may have to make up; because upon the exercise of such judgment greatly depends the excellence of the result.

Of course you know that we must use stout cotton and make close stitches, taking a firm hold, in working on coarse material, while thinner and more delicate fabrics require much finer thread and lighter sewing.

Strong cotton and heavy work would tear and destroy the finer material; while fine cotton and loose stitches, would not hold together a garment made of stout material. Do not grudge any pains or trouble to make whatever you undertake as perfect as possible. Remember that **What is worth doing at all is worth doing well:** then you will not be tempted to slur over any of your work. You must endeavour also to profit by the following hints:—

1. Take care to sew evenly without pulling your cotton too tight, or you will pucker your work.
2. Fasten your thread on and off firmly, as you have no doubt been taught to do.
3. See that your fells lie flat, and are of uniform width throughout the length of each seam.
4. Mind that all your hems are turned down and your tucks are run exactly by a thread; that your stitching and your gathering are regular too.
5. Be sure that you **stroke**, and **not scratch down** your gathers, as so many girls do; and thus partially wear the material out before it is made up. Then set them in carefully and well.
6. Do your utmost to make good button holes. They must on no account gape, but should have even edges, that meet exactly without overlapping, and strong, secure ends.
7. Let your marking be clear and distinct, true to a thread, without long, loose slippings of the cotton, but having the wrong side as neat as the right.

Herring-boning, as you know, is one of the chief stitches used in making up flannel, and this looks very bad indeed if it be done irregularly. The size of the stitches depends of course on the texture of the material.

Patching is one of the most difficult tasks for unskilful fingers, and yet with a little care and management it is very easy. It is, too, one of the most requisite things in a family. If the material be plain, it is only necessary to see that the patch is on the same way of the threads as the part to be repaired. But if the garment torn be of printed fabric, we must exactly match the pattern or the stripes. When you patch turn down the edges of the new piece, and lay it on so that it extends at least half an inch beyond the hole on all sides; then tack it in place, and neatly *hem* it round, because that stitch looks neater for the purpose than the sewing stitch. This done, cut away the rags from the inside, and neatly fell it of even width on the four sides, making the corners clear and square. A flannel patch must be shrunk before being put in, or else it will strain, and look ugly the first time it is washed.

Sewing machines of different kinds are now employed to do great quantities of work, and most garments can be bought ready- i.e. machine- made. But as a rule the work is neither so neat nor so strong as that done by hand; and it always requires looking over before wearing, to secure the ends of the sewing threads, which are apt to be left unfastened.

Sewing machines are sometimes very valuable, as for example in a large family where there is a great deal of making and repairing to be done; and perhaps only one or at the most two pairs of hands to accomplish it. In such a case the constant close application to hand needlework, would be very tedious and wearisome, as well as injurious to the health. It is true that all the work for the machine has to be cut out and fixed, and the machine itself requires some person to guide and work it, but then it does the actual stitches.

No sewing machine work, however, will equal, far less surpass, that of the most perfect natural machine, the human hand. So do your very utmost to make all your clothing by that.

Darning is a stitch that can only be done by hand, and unfortunately it is very frequently badly done, the reason being, probably, that few persons are fond of practising it—and perhaps you are not; but in that case you must try to make yourselves like doing it; because it would be very selfish to indulge your disinclination at the expense of others, for badly mended stockings blister the wearer's feet.

If you have charge of the socks and stockings belonging to your father, brothers, or sisters, watch them closely, and repair the thin places as they appear, by weaving in the stocking stitch as it is called. Mend the holes either by wave or plain darning; but whichever you choose, do it as perfectly as you can.

Take pains to learn fancy darning too, for the repair of damask or other table linen. You will find it most interesting to trace out the more or less intricate pattern; and then after practising it on coarse material, weave it into the part of the finer one to be mended.

Be ambitious to become excellent needlewomen, and test your skill from time to time, not only in the making and mending of underclothing, but also in the repairing of anything and everything belonging to your homes. Variety in needlework, as in everything else, is charming; and a fair trial will show you what an astonishing number of different things can be accomplished by willing hearts, and skilful hands.

We ought always to feel that it is one of our highest duties, as it certainly is one of our greatest privileges, both to minister to the comfort of, and to give pleasure to, others.

Knitting must have a few words said about it. Every girl ought to be able to knit stockings well, so as to keep herself and all the other members of her family thoroughly supplied; for knitted stockings let it be repeated are warmer, more durable, and far more comfortable to wear, than woven ones.

Knitting is a very simple process to master, but you must take pains to make your stockings of a good shape so as to fit comfortably. The parts requiring special attention are the narrowing in the leg, and for the toe, and the turning of the heels. Remember this also when you repair them by knitting in new feet.

The wool called Scotch fingering, is excellent for the purpose, when you can get it good. But much inferior wool is now sold under that name; and hence many persons have been grievously disappointed to find that after paying a high price for the material, and taking great pains with the knitting, their stockings have soon dropped into holes.

The only remedy is to endeavour to become clever in choosing the wool, and to purchase it at the most trustworthy shops.

We cannot do more in a single lesson than give a few hints and suggestions on the wide and important subjects of needlework and knitting. But we hope that what you read here will induce you to value them more highly, and make you willing and anxious to practise them whenever opportunity offers. If you can sew and knit, mend and darn well, you will be right helpful and valuable girls and women; if not ——but we hope you will.

LESSON XVIII.

TEXTILE FABRICS.
WOOL AND SILK, AND THE PURCHASE OF THEM.

DERIVATIONS.

Textile.—Woven. *Lat.* **textĭlis**, wrought.
Fabric.—*Lat.* **fabrĭcātĭo**, something constructed by art.
Intelligence.—Understanding. *Lat.* **intellĭgo**, to see into.
Delicate.—Fine, dainty. *Lat.* **dēlĭcātus**, luxurious.
Stability.—Firmness. *Lat.* **stăbĭlis**, enduring.
Costly.—Of great value.
Superior.—Higher, better. *Lat.* **sŭper**, above, over.
Monopoly.—The sole power of selling any species of goods. *Gr.* **monopōlion**, the exclusive privilege of selling.

PRONUNCIATION. Exercise on *A*, *AI*, &c., in
way, to play, a sail, rain, (he had) lain, twain, chilblain.

Part I.

When studying the geography of a country, it is well for us to remember, that the wealth and prosperity of the inhabitants depend somewhat upon the natural resources of the district; but a great deal more on their own honesty and hard work. These natural resources include the produce of the mines and quarries, and the timber to be obtained from the woods or forests, as well as the staple crops yielded by the soil.

Man using his intelligence is enabled to increase the number and kind of productions, by attention to agriculture and cattle-rearing; thus, he obtains corn, fruit, textile fibres, and animal products in great abundance. In the commercial world these are technically called raw produce.

A very small proportion of the raw material used in the textile manufactures of the British Isles is home produce.

We import **cotton** from North America, India, Egypt, and Brazil; **silk** from South Europe, China, Japan, and Bengal; **wool** from Australia, Bombay, and South Africa, the finer varieties, such as alpaca and llama, from New Granada, Peru, and Chili; **flax** is produced largely in the North of Ireland, in the province of Ulster, but further supplies come from Belgium, Russia, and Holland; and we obtain **jute** and coir or cocoa-nut fibre, for the manufacture of sacking and cordage, from British India, Bengal, and Burmah.

The manufacture of textile substances ranks high as a source of wealth to our nation; and it furnishes work for between two and three millions of the labouring population.

The two most valuable animal products employed for textile fabrics are wool and silk.

The **woollen manufacture** was introduced into England during the Norman period, and it rapidly rose into importance. But it was not until the fourteenth century, in the reign of Edward III., that every branch of the industry was completed in England. Before that time, the spun yarn was sent to Flanders to be woven.

You may possibly have read in your history how the French King John, in derision, called Edward III. the "wool merchant," because most of his wealth was derived from a tax on wool.

The wool of different animals varies much in quality, hence many kinds of materials are derived from this source. The wool of the English sheep is deservedly famed in the market, and is used chiefly for making flannels and other worsted goods. The finest European wool is obtained from the Spanish merino sheep. The llama of Peru, and the Angora goat have wool of a very fine and superior quality; and the Thibet goat produces the delicate fibres, of which handsome and expensive Cashmere shawls are made.

The woollen trade of England at the present day is second only to that of cotton. It has three chief centres of manufacture: one in the West Riding of Yorkshire, where there are huge factories employing thousands of men and women, boys and girls, near those great hives of industry Leeds, Halifax, Huddersfield; another, mostly of flannel, in North Wales, in parts of the counties of Denbigh and Merioneth; and the third in the west of England, occupying towns in the Golden Valley of Gloucestershire, and in the adjacent parts of Wilts and Somerset. Serge is made in Devonshire.

There are two main branches of this industry. Firstly, the **woollen trade**, or manufacture of short, fine-fibre wool, into such substances as broadcloth. The peculiar soft nap on the surface of such goods is produced by a process called "fulling," or "milling," in which the fibres are beaten with wooden hammers and passed between heavy rollers. This causes the fibres of the wool to felt, or cling together, so as to hide the yarn of the warp and weft. If some of these tiny fibres are placed under a microscope of ordinary power,[1] and minutely examined, it will be seen that each thread is covered with tiny scale-like rings, lying one over the other like the tiles on the roof of a house. As the felting proceeds, these scales catch into each other, and form a close nap on the surface.

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[1] See the picture in the lesson on Wool in Standard III., p. 96.

Secondly the **worsted trade,** which is the manufacture of long-fibre wool, into such materials as flannels, blankets, baize, moreens, and also some dress materials, such as merino, serge, and linsey. The coarse English wool has fewer scales than the fine varieties, and hence it is best suited for these materials.

Flannels are perhaps the most generally used, and most important of all the woollen fabrics ; and in our changeable climate should always be worn next the skin. As flannel is a bad conductor of heat it does not allow the warmth of the body to pass away. Flannel also absorbs perspiration as fast as it leaves the pores of the skin, without permitting a chill to the body. The commoner kinds of flannel contain much cotton, and are therefore neither so warm nor so durable as those composed entirely of wool. Therefore never buy common, cheap flannel.

Welsh flannel, which is of a bluish tint, is generally considered best for ordinary wear, because it combines all the desirable qualifications of warmth, durability, thickness, and softness. But many other kinds are excellent. The chief rule to be observed in purchasing flannel goods is this, **Choose those which are very soft to the touch.** The least hardness indicates the presence of cotton, and consequently marks an inferior material.

The manufacture of **blankets** is an important branch of England's worsted trade. It was first established at Bristol by Thomas Blanket, who thus gave his name to the special production. The best at present obtainable, are called Witney blankets, because the best were formerly made at Witney, in Oxfordshire.

The same rules hold good in selecting blankets as in choosing flannels; but the chief value of blankets depends upon the length, and closeness of the pile. The weight is also a good guide, for the heavier the blanket, the warmer and more durable it is likely to be. There should also be a thick, close "nap" on the surface, but this cannot be relied upon by itself, as the manufacturers can make inferior goods appear thick and warm, by an artful arrangement of the upper threads, in the process of weaving. Artful arrangements when meant to deceive, are base and wicked.

A more modern branch of the great woollen trade has, however, been developed, viz. the **shoddy trade.** Large mills in the neighbourhood of Dewsbury and Batley, in Yorkshire, are engaged in the production of a material known as shoddy. Old woollen garments, out of which the last item of wear has been extracted, appear at the shoddy mills, together with defective pieces of material from the factories; these are teazed to shreds by an instrument called the "devil"; the fibres are then respun and rewoven.

Of course there is neither the strength nor the stability in such material, that there is in good woollen stuff; though it may be made to look very well for a time. Purchasers should beware of such goods; they are manufactured to **sell**, and not to **wear.** Beware of shoddy "costumes." **The best is always the cheapest in the end.** It is far wiser to expend a little more money on a thoroughly good article, which will remain respectable, and serviceable to the last; than on a common one, for it will soon grow shabby and prove a continual source of annoyance to the wearer; the first shower of rain spoiling it, and the stitches tearing out when it is mended.

Part II.

Silk.

Silk is the produce of a small greyish-white caterpillar, now reared in many parts of Europe and America, but formerly confined to India, China, and Japan. The early possessors long held a monopoly of the trade, for they jealously guarded their treasure, and produced a beautiful web-like material, which they sold for immense sums of money.

At last a monk hid away some eggs of the silk-worm moth in a hollow cane, and contrived to carry them away without detection; and thus the coveted silk was introduced about the sixth century into Constantinople, and from thence it spread through the countries of Southern Europe.

As you have read the lessons on the **Silk-worm**, and **Silk cocoon**, and **Silk** in Standard III., it is not necessary to repeat here what is there told you.

The manufacture of silk thread is carried on chiefly in North Staffordshire and Cheshire. Spinning the waste silk, is a branch of trade carried on in separate mills.

There are different varieties of the silk-worm, which produce various hues of silk; from white, through every shade of straw colour, to a bright yellow. The produce of one worm measures from 600 to 1000 yards in length, but it is nevertheless so light, that sometimes more than 1000 cocoons do not yield above half a pound of silk.

A good silk combines softness of texture, with a smooth, lustrous surface. Formerly materials were judged of by weight, a heavy material being looked upon as a sign of a good quality. This cannot now be relied upon as a test, as the substance is sometimes increased by gum and dye, especially in the darker shades and black. Silks, as well as woollen goods, are too often made for show, and to sell, rather than to wear.

The chief silk fabrics are, **handkerchiefs, scarves**, and **broad-silks**, including dress-silks, glacé, and gauzes, and are made principally in Spitalfields, Middleton and Leigh in Lancashire, and there are some extensive mills in Manchester. The trade is also carried on in some towns of Scotland.

Ribbons have the great centre of their manufacture at Coventry, and **crape** is made chiefly in the east of England, at Norwich; while the **stocking** and **glove** trade have their seat at Nottingham and Leicester.

Satin is much softer than broad-silk, and is woven so as to show the full gloss and beauty of the material. In **moiré-antique** the threads are stouter, and the fabric consequently stiffer than in ordinary silks. The breadths are "watered" by being rolled under very heavy pressure. **Velvet** is a material entirely different from other silken fabrics, and is noted for its exquisite richness and softness of surface, obtained by the use of a number of threads in addition to those requisite for making plain material. These extra threads are woven over wires furnished with a groove in their upper surface, and before they are removed a cutting instrument called a "treval," is passed along the groove, thus severing the loops, and forming what is called the "pile."

Velvets are woven in London, at Spitalfields and Bethnal Green. Good ones must always be expensive, for it is said that the most expert workman cannot produce more than a yard per day, because he is compelled to stop after every shoot to cut the threads. In choosing velvet we must always remember that its great beauty depends upon the closeness of the pile, so that the foundation cannot be seen through it. The backing should be soft and composed of silk; some cheaper kinds are frequently made with a silk face and cotton back; but then the foundation soon wears brown and shows through the pile, giving a rusty appearance to the fabric.

Large quantities of **trimmings** for dresses, hats, and bonnets, are manufactured of silk; as are also **plush,** rich **furniture stuffs, tassels, cord,** and **gimp.** These form by no means an unimportant branch of the trade.

Persons should never be tempted to buy cheap silks, as they are mere imitations, and like all shams are bad bargains, for with very slight wear they become flimsy and worthless. There is great complaint at the present time (1878) that silks are very poor, and inferior in quality, and that it is impossible to obtain pure fabrics. The fibres used in the manufacture are so artfully loaded with dress and dye, that although the material may appear lustrous, rich, and good, when first made up; yet with very little wear the silk cracks, and becomes greasy-looking, while a shower of rain completely spoils the garment.

LESSON XIX.

COTTON MATERIALS: PRINTS. LINEN GOODS. RULES FOR CHOOSING THEM.

(See Lessons XIX., XX., Standard III.)

DERIVATIONS.

Monopoly.—*Lat.* **mŏnŏpōlĭum,** the exclusive right of selling a thing.

Export.—*Lat.* **ex,** out, **porto,** to carry.

Commercial.—Intercourse for trade. *Lat.* **commercĭum,** an article of traffic.

Filaments.—Little strings. *Lat.* **filum,** a thread.

Elegant.—Tasteful. *Lat.* **ēlĕgans,** choice.

Durable.—Lasting. *Lat.* **dūrābĭlis,** lasting.

Discernible.—Clearly to be seen. *Lat.* **discernĭbĭlis,** that may be distinguished.

Elaborate.—Finely completed. *Lat.* **ēlăbōro,** to work out diligently.

Invaluable.—Highly prized; not capable of having its value stated. *Lat.* **in,** not, and **vălĕo,** to be of value.

PRONUNCIATION. Exercise on sounds of *E*.

to swear, to wear, a mare, barley, a harrow, eleven, bellows, eldest, flesh, length, strength, stench, drench.

Part I.

COTTON is a vegetable production of tropical countries. The plant is not a native of America, but it has been introduced into the United States, which for many years supplied nearly the whole raw cotton required by England.

During the last civil war between the Northern and Southern States the cultivation was neglected, and no cotton could be procured for the English market. As a consequence of this, thousands of English operatives employed in the factories were thrown out of work, and frightful distress prevailed. In the great cotton towns of Lancashire the suffering was terrible. Numbers unable to find work died of starvation, and thousands more must have perished, if some charitable persons had not opened a fund for their relief.

The "cotton famine," as it was called, will be long remembered.

Learning thus, from sad experience, what disastrous results followed an interruption in the supply of raw cotton, the English Government determined, if possible, to introduce the cotton shrub into some of our colonies, and their efforts have been crowned with success.

Cotton fabrics are not so durable as those of flax or silk, but they are much more popular, because they are comparatively cheap, and may be used in numberless ways. For under garments, calico is much warmer and almost as serviceable as the linen which it has superseded; but it does not retain its colour so well with frequent washing. Cotton materials are manufactured of various widths, from three-quarters of a yard, or twenty-seven inches, to three yards wide, in order to suit the different purposes for which they are intended.

There are two classes of fabrics manufactured of cotton—viz. those spun, woven, and sold so that the natural colour of the raw material remains unchanged, and called **unbleached**; and those which have been deprived of that hue by artificial means, and are hence termed **bleached.**

The modern process of bleaching is effected without weakening the fabric much; but the universal opinion of housewives is, that unbleached calico is the more durable. It is a trifle cheaper per yard, too, than the bleached, and the real quality of the cloth is more readily *discernible*, than when the fabric has been whitened by dress and stiffening, which have been mechanically forced into its substance. Unbleached calico soon becomes white with washing, and it retains its purity of aspect much longer than that which has been artificially bleached.

The art of bleaching was totally unknown in Great Britain until the middle of the last century. Before that time, it was customary to send all the brown fabric manufactured in this country to be bleached in Holland.

The modern method of bleaching cotton includes about twenty-five processes, and the average cost of it is 10*d.* per piece of 24 yards, or not quite ½*d.* per yard; and all these processes are completed in a few hours.

The following rules may help you in buying calico:—

First. Calico is best when it contains the smallest quantity of dress or stiffening. You may ascertain the amount of stiffening, by rubbing a small corner of the material between your hands, when the real quality will become apparent.

Second. The texture should be close, that is, the threads should be thickly woven, and of uniform size throughout. Thin cloths are never so durable as those of stouter substance.

Third. The selvage should be even, and the surface free from lumps and knots.

Fourth. With regard to calico, as with other textile fabrics, a low-priced article is inferior in quality, and therefore unserviceable and uneconomical.

Some cotton materials are employed for making dresses, as **prints** and **muslins.** These are subjected to additional processes, which give them the patterns of various designs and colours, according to the prevailing taste, or the prevailing want of it.

Jaconet muslin and **lawn** are very fine varieties of cotton goods.

Gingham and **nankeen,** formerly much used, are now out of date. **Linings** of various kinds and colours are made of cotton, such as **twill, glazed,** and **silesia.**

Highly decorative and *elaborate* patterns are stamped on some cotton goods, such as **chintz,** and the more modern material, **cretonne,** used for curtains, and various other articles of upholstery.

Cotton is sometimes mixed with silk and wool, but it is not an improvement to either, for mixed materials of any kind do not wear well.

A minor branch of the trade is carried on at Nottingham, the chief town for cotton **hosiery** and **gloves.** The stocking-weavers do not work in factories, but receive the materials from the masters, and manufacture the articles in their own stocking and glove frames at home.

Part II.

(Refer to Lesson XXI., Standard III.)

Linen is the most durable of textile fabrics after silk. It is a material woven from the fibres of the stem of the flax plant. The botanical name of the genus to which the plant belongs is Linum, hence the term linen.

Linen has been used in the East from the earliest times, and the Egyptians were specially celebrated for their manufacture of "fine linen." Of late years, however, it has been supplanted there by cotton, which is cheaper and warmer.

Flax is grown abundantly in Ulster, the northern province of Ireland, but the yield is not nearly so great as it once was. The plant yielding it is an annual, bearing a pretty blue flower. You can grow some for yourselves, if you will sow a little linseed in your gardens.

The British Islands are celebrated for the linen manufacture, but by far the larger part of the production comes from Ireland.

The chief seat of the Irish trade is in the north of the country, Cookstown and Ballymena being the centres of the flax markets and mills. Belfast, in County Antrim, is the town for exporting the finished cloth.

Irish **plain linen** is famous, as no doubt you are aware. It is used for undergarments, and the fine parts of shirts, such as cuffs, collars, and wristbands. The prices vary from about 1*s.* 2*d.* per yard for the coarser varieties, to 2*s.* 6*d.*, or even more, for the fine kinds.

Cambric, so called from having been made first at Cambray, in the North of France, is a very expensive and delicate fabric.

The manufacture was formerly more extensively pursued in England than at present, and it was once an important industry of Scotland. The chief centres you are to look for on the map are Leeds and Bridport in England, and Fife and Forfar in Scotland. In olden times the flaxen fibres were spun into yarns by the maidens of the family, who were hence termed "spinsters." The yarn thus produced was not woven at home, but was sent out to weavers who possessed looms, and earned their living by making into cloth, the thread supplied by private families.

This is still the case in the Isle of Man. The writer remembers the spinning-wheel, and balls of thread, in cottages thirty years ago. But even if a person worked very industriously, she could not spin more than 1 lb. of yarn a day; so that when the loom was improved, as it soon was, the weavers were unable to obtain sufficient thread to weave.

Before the introduction of cotton, underclothing was made entirely of linen; but many persons do not like it now, on account of the chilly sensation which it causes to the skin. This is because it is a very good conductor of heat, so that the warmth of the body rapidly passes through it and is lost. In this quality it is exactly the reverse of flannel, which is a non-conductor, or a retainer of heat.

There are, however, still many articles in household use, for the manufacture of which flax is specially adapted. Among these are **damask** cloths and napkins for table linen; bed linen, such as sheets and pillow-cases; **ticking** for covering mattresses and beds; **huckaback** and similar materials for chamber towels; **union** for blinds, and **diaper,** which is similar to damask, but usually with a minute diamond-shaped pattern in place of the more splendid designs of table-cloths. Damask is named from Damascus, in Syria, and diaper from d'Ypres, in the north of France.

Tea-cloths, glass-cloths, and dusters should always be made of linen. China and glass never can be made to look bright and clear with cotton cloths, owing to the lint which constantly rubs off.

Old linen is **invaluable** for making dusters to rub furniture; and it is useful for bandages and lint, to bind up cuts and wounds. It may interest you to know also that the best kinds of cream-laid notepaper are made from white linen rags.

LESSON XX.

CUTTING OUT. PATTERNS.

DERIVATIONS.

Proverb.—A common saying. *Lat.* **prōverbĭum,** an old saying.
Energies.—Powers. *Gr.* **en-ergon,** force.
Perseverance.—Firm persistence. *Lat.* **persĕvēro,** to proceed strictly with anything.
Defective.—Faulty, imperfect. *Lat.* **de,** not, **factĭto,** to make or do frequently.
Accustomed.—Used to. *Lat.* **ac,** to, and **consŭetūdo,** a habit.
Dimensions.—Precise measurements. *Lat.* **dī-metior,** to measure anything.
Proportion.—*Lat.* **proportio,** the comparison of one thing with another, as to size.

PRONUNCIATION. Exercise on sounds of *E* contained in

bench, to wean, men, awe, edge, egg, hedge, to lay, to say, sedge,
wedge, to ail, to let, wet, nettle, meat, kettle.

PROBABLY you have often heard the old proverb that "Cutting and contriving is better than early rising," though most likely you have thought little about it. It is, however, such a wise and true maxim that we want you to listen to its teaching, and try to profit by it. Early rising, as you well know, is a most excellent habit. It brings roses to your cheeks, and lights up your faces with smiles of good temper. So if the power to cut out well is still more beneficial, it is, as you may imagine, a very desirable possession. The fact is, that while early rising mainly benefits our individual selves, ability to use our scissors skilfully, furnishes us with a marvellous power of adding to the comfort and pleasure of those around us, and the exercise of it greatly increases our own. For you should always remember, that those persons are happiest in the world who are most helpful to others. Perhaps you can already fix your work nicely, and do each stitch perfectly; if so, you have achieved a great deal, but until you can cut out economically, you will not be excellent needlewomen.

It is not very easy to learn, you may think. Well, perhaps it is not; but few things worth acquiring are easy to learn, and there is little merit in being able to do what everybody else can do, with no trouble to themselves. So bend your utmost energies to the task, and sooner or later your efforts will be amply rewarded. Do not mistake, however, for it will demand of you close attention, careful observation, much patience and perseverance, and success is the result only of long practice, and perhaps of many failures. Yet when it does come, you will feel fully repaid for all your previous disappointments.

Some persons have a natural taste for shaping things; others, less gifted, can take the patterns of various new garments from older ones. No doubt many of you have practised this when making new clothes for your dolls. If so, you will be encouraged to know, that you have taken at least a step in the right direction. Of course, as learners, you must not begin by cutting out material, because you would be certain to waste a great deal of it. But whenever you have the chance, you should stand by and watch a competent person do so; for her movements ought to supply you with many hints for your own future guidance. Notice how she contrives to turn every bit of material to account, and how cleverly she manages to make the different parts of the pattern fit one into the other. If she saw you attentive and anxious to learn, very likely she would explain to you, why she did this or that in the process.

Then you might try you own skill by copying the shapes of some of your underclothing. You can do this best, by laying the garment on a piece of soft yellowish-white paper; which you should then cut to the size, leaving about half an inch every way for turnings in. Do not attempt to use newspaper, as it is far too stiff and unmanageable for the purpose. To make sure that the pattern is accurate, lay it once more on the model, and test it everywhere. If it be in the smallest degree defective, either in shape or in proportion, make the necessary alterations and improvements, for none but perfect patterns are safe or useful guides. Remember that if your clothes do not fit well, it is because they are badly cut out; so you had better tack your pattern together and try it on, and if it does not sit properly in some places, do your best to find out the cause and remove it. To begin with, attempt the patterns only of simple garments in this way; for you will find even these difficult at first, because cutting out requires such very great exactness.

As you practise, endeavour to train your eye, so that you will be satisfied with none but the best possible shapes for your own garments, and then you will be equally particular in cutting out those belonging to other persons. After a time, you will not find this difficult, especially if you have learnt to draw; because you will thus have been accustomed to observe exactness of form, and will be therefore better prepared to adapt your patterns to the figures they are intended to cover; and you will thereby avoid the too common error, of thinking that what will fit one child ought to fit another of the same age.

It is almost as important that our underclothing should be of a perfect cut as our outer garments, if we are to wear them with comfort. Hence it is really sad to find how many persons put up with ill-fitting, almost shapeless, and consequently uncomfortable garments, year by year; either because they lack the ability or will not be at the pains to improve them.

The next step is for you to learn to cut out exactly, by measure, and now you will require to use an inch tape. You had better begin with some simple garment. First ascertain the dimensions of each part of it, and enter these on a piece of paper just large enough to take the pattern. Never allow yourselves to be extravagant in using the paper, or you may be tempted to waste material by and by. With your lead pencil mark off the necessary curves and slopes, and draw a complete outline of the full-sized pattern. Notice the relative proportion of the parts, and do not use your scissors until you have made as accurate a copy as you can.

When you have cut it out, tack it together, and test it everywhere by the model, and if necessary try it on as before. If you find it correct, label it, and put it securely away for future use. It is very convenient to have exact patterns of our clothes, without being obliged to take them each time we want to make new ones.

When you have become expert in this, you will soon be able to cut out by any scale of measurement; as well as to calculate the precise quantity of material, required to make garments for individuals of any size.

When there is a large number of scholars to be taught cutting out, the teacher generally draws the pattern on the blackboard; and then, telling the class what scale they are to use, requires them to name the proportionate dimensions of the parts, before they begin to cut it out. Perhaps that is how your schoolmistress will teach you. Such lessons may be made very interesting, and if you are intelligent and painstaking, you will soon be able to cut out patterns of all kinds. Practise thoroughly in paper, and then there will be little danger of your subsequently wasting material.

It is also very important that you should know the right and the wrong sides of all fabrics, especially of calico, linen, and flannel; and which way of the material the various parts of a garment should be cut. This is necessary, because if some of them be cut on the wrong way, they often pull and strain, and are apt to be uncomfortable to the wearer. Besides, flannel and other woollen fabrics do not wear so long under these circumstances.

Cotton goods will always tear straight, but linen must be cut by a thread.

It is an excellent plan to shrink flannel, and to wash calico and linen, to remove the dress in them, before cutting them out.

When you have decided upon the shape, spread the material on a table, and lay all the parts of the pattern upon it. Make them fit nicely into each other, put them in place, and cut them out. It has often been said that though anybody may cut out by exact paper patterns, the real art of shaping things is a gift possessed only by the few, and one which requires long practice to bring it to perfection.

Well, it may be so, but until you have tried your very utmost, you cannot possibly tell whether or not you are among the limited number thus gifted. At any rate we should all remember that the higher we aim, the higher we shall attain. So be ambitious to excel in this, as in every other useful accomplishment. Try to realize what a happy day it will be for you, when your mothers can say that you are very helpful to them. How glad you will be to hear them praise the skill, neatness, and care with which you cut out and make, not only your own underclothing, but also many garments for your little sisters, and even pretty suits for your tiny brothers!

LESSON XXI.

PINS, NEEDLES, AND BUTTONS. HOOKS AND EYES.

DERIVATIONS.

Invented.—Discovered. *Lat.* **in-vĕnĭo**, to light upon a thing.
Perfection.—Thorough completion. *Lat.* **perfectio**, a finishing.
Experience.—Knowledge gained by practice. *Lat.* **ex-pĕrĭor**, to put to the test.
Processes.—Gradual steps of manufacture. *Lat.* **prō-cēdo**, to move on.
Japanned.—Varnished, so named from resemblance to the polished goods of Japan.
Innumerable.—Countless. *Lat.* **in**, not, **nŭmĕrābĭlis**, easily numbered.
Enumerate.—To tell one by one. *Lat.* **nŭmĕro**, to number.
Appreciated.—Valued. *Fr.* **apprécier**, to set a price.
Foundation.—Ground or support. *Lat.* **fundātĭo**, foundation.

PRONUNCIATION. Exercise on *E* and *EE* in

queen, a quean, ten, thirteen, to read, he read, speed, feed, need, sweet, feet, to meet, a beetle, eye, height, keep.

THE heading of this lesson gives you a list of very useful articles. What should we do without **pins**? Perhaps as you have generally been well supplied with them, it may not have occurred to you that long ago there were no pins. And we may add that it was some time after they were invented before they were brought to the present state of perfection. "Not worth a pin" is a common expression to imply total absence of value, and yet these little articles are made with much labour. Pins, like other convenient contrivances, are intended to be rightly used, and not abused. Therefore you must never offend your mother's eye by fastening your dress with a pin, and thus presenting a slovenly appearance, instead of neatly mending a torn place, and presenting a tidy one.

A pin appears to be a very simple object; yet the wire of which it is made has to be subjected to many processes before the bright finished little article is produced. Ordinary pins are made of brass wire, beaten, hardened, cleaned, and cut into proper lengths, ground, pointed, and headed. Not long ago it required about ten separate people to make a pin—one man drew the wire, &c., &c.—but now the whole is made by machinery, and the head is a solid part of the pin.

The heads were formerly made, and fastened on separately, but these are now superseded by "solid heads." When the pins are finished they receive a final whitening and polishing; but if black pins are required, they are japanned instead. Nearly all these processes are, as we have already said, now performed by machinery; whereby the labour, and cost of production, are much lessened.

Pins were at first very dear, and ladies were sometimes allowed so much for "pin money."

We often buy pins stuck neatly in rows on paper. Children called "paperers" are mostly employed in preparing these, and their little fingers become exceedingly expert in the process.

"Short whites," contained in half-ounce or one-ounce packets or boxes, are commonly sold, but pins of many sizes and kinds are employed for domestic purposes. A special kind is known as the **safety pin,** which has a wire loop to act as a sheath to protect the point, when it is used to fasten dresses or shawls.

Hair-pins form another branch of the trade. They are japanned, to make them black, and are to be obtained so cheaply, that there is no excuse for wearing bent or rubbed ones to put up your hair. Birmingham has a large share of the pin manufacture. It has been calculated that fifty millions are made daily in this town alone. London and Warrington are also centres of the same industry.

Needles of all kinds, suited to the innumerable purposes for which they are employed, are made of very fine hard steel wire. The varieties are almost endless, from the most delicate surgical needles used by doctors to close gaping wounds, through the many sizes constantly needed for household sewing, to the stout carpet needle used by upholsterers, the thick ones so useful to saddlers, and the large slightly curved instrument which can be threaded with twine, and is employed to secure hampers and packages. The chief seats of the manufacture are in the small towns of Redditch and Alcester, which you will find marked in the map of England, in the counties of Worcester and Warwick. As needles are made of polished steel they are very apt to rust, and no one can work well with a rusty needle, because it is difficult to force it through the material, and it also leaves ugly rust-marks behind it. To avoid this inconvenience, you should always have a neat little housewife, or needle-book, and stick your needles carefully upon the flannel or cashmere leaves of it. The best recipe that we can give you for keeping your needles bright, is to use them constantly, and do a great deal of needlework.

We cannot stay here to enumerate the many kinds of wonderful and beautiful work which may be produced by this simple little instrument. Many hundreds of years ago, before our needles were invented, we read that needlework was highly appreciated, for in one of the Psalms, David speaks of "raiment of needlework" as suitable clothing for a king's daughter.

You should always be particularly careful not to leave needles lying about, after having used them, for they are sharp little instruments, and may do much mischief if they run into any one's flesh. Hence also you should carefully throw the pieces into the fire, when you break a needle, lest they pierce somebody's hand or foot, and cause much suffering.

Buttons of various materials and patterns are employed for dress fastenings and for ornamental purposes. There are **metal** buttons of all kinds, stamped with different designs, plain, raised, or flat. **Horn** buttons with or without shanks, are made from the hoofs of animals. **Pearl buttons** are exceedingly pretty, whether they are of dark, or smoky pearl as it is called, or exhibit the beautiful tints of mother-o'-pearl. **Bone**, either white or dyed, and its more aristocratic ally, **ivory**, are largely used for the same purpose. Buttons of fancy glass, jet, carved wood, and a stiff composition which can be moulded into the required shape by machinery, are also very common.

Covered buttons are made for waistcoats and dresses, by covering wooden moulds, or iron rings, of the required shape, with textile materials to match, or contrast with the garment, which they are to adorn. The manufacture of all kinds of machine-made buttons is carried on extensively at Birmingham, where no less than 400 hands sometimes work in one factory.

Other dress fastenings are **hooks and eyes**, made of a fine wire twisted into the compact shape of a hook or a loop. We should not recommend you to use eyes for your dresses, except to fasten the waist-band of the skirt; they are apt to give an untidy appearance to the body by allowing it to gape, and are not so secure as buttons.

The best loops are those made in the stuff with silk twist or cotton. But these soon wear out if they are not firmly worked; so always make a good foundation of cotton and work over it with thick sewing silk or twist, taking pains to make all your stitches regular and close together.

LESSON XXII.

EVERY GIRL HER OWN DRESSMAKER.

DERIVATIONS.

Executed.—Finished, completed. *Lat.* **exsecūtĭo**, performance, accomplishment.
Remedy.—Cure, reparation. *Lat.* **rĕmĕdĭo**, to cure.
Imitate.—To make one thing like another. *Lat.* **ĭmĭtātĭo**, a copying from a model.
Involves.—Includes. *Lat.* **involvo**, to roll in.
Diminish.—Lessen, decrease. *Lat.* **dī-mĭnŭo**, to make less.
Disregard.—Neglect of. *Fr.* **dis**, not, and **garder**, to take care.
Array.—To dress.

PRONUNCIATION. Exercise on *Ǣ* = *ÉÉ*.

hair, there, were, where, fear, a breath, to breathe, cheese,
a wave, weigh, whey, neigh.

You may at first be inclined to think that it is too much to expect you to become little dressmakers. But it is not. If you be now so expert in plain needlework as to be able to turn your underclothing out of hand, both well cut and perfectly finished, you will not be inclined to rest there. Delighted that your efforts have been thus far rewarded, your very success will incite you to try new and more difficult tasks. The pains, too, by which you have hitherto mastered each tedious detail, will have developed in you that taste for needlework of all kinds, which every girl and every woman should possess.

The duties of home life are specially feminine, and therefore we ought to find our greatest happiness in discharging them to the utmost of our ability. There is not the least reason why you should not learn dressmaking. It is by no means difficult, and the same patient application and persevering industry which you bestowed on the making of your undergarments, will ensure you an equally good result with your upper ones. When you are sufficiently skilful to make and turn your own dresses and jackets, and those of your younger sisters, you will be a really valuable help to your mothers. And this should be your proud aim at all times. The very thought of it ought to make you anxious to set to work at once.

Besides, you will thus soon save the outlay of many pounds, for probably you have little idea how much it costs even in one year to pay for making the clothes of a whole family. With an excellent pattern and care in the putting together, dresses made at home will fit as well as those executed by a first-rate dressmaker. But remember that it is hopeless to expect such a result if you have an imperfect pattern; for, though the actual stitches if not well done may be improved, yet a badly cut dress is without a remedy. The first essential being an exact pattern, if you have not one, take it in the way you have been taught, from the dress that fits you best. When you have used it put it away safely, and keep it for future occasions. But do not forget to try it on every time you are going to make a new dress, to ascertain whether it requires any alteration or not. You may have grown taller or stouter or thinner since the last was made; and if you did not take this precaution, you might be disappointed to find that your dress did not fit, after all your pains and trouble.

Perhaps you had better try your hand first on a child's frock, or a very young girl's dress, because the style of these is simple. Or you might begin by turning an old dress of your own; for, as you take it to pieces you can observe how the parts are put together, and thus learn to imitate it in the re-making.

It is a good plan to have a best dress occasionally made by a first-rate hand, to serve as a model for your own productions. You might also gain a great deal of information as well as actual practice, by volunteering your services to friends who are having dressmaking done at home. Thus you would have opportunities of seeing each step in the process, which would be a most valuable guide to you in the future. Moreover, you would be doing a kind turn, which is a good thing; and you would be making yourself useful to others, which is the end of all valuable education.

We must now say a word or two about the material, for the width of fabrics varies so much, that beginners are often sorely puzzled with them. Different kinds of fancy goods, and certain makes of silk, for example, require special care; and, while velvets are frequently only 18 inches wide, French merinos and cashmeres measure 40 inches. Besides being of a convenient width to manage, however, the two last-named materials, together with alpaca and print, are the most useful and durable for dresses. Of late years black velveteen has been much worn; it is very strong, but is apt to turn brown.

It is easiest for amateurs to make up plain materials, for stripes and patterns require to be matched, and to do this economically involves greater care. All sprigs and flowers must be made to run upwards, and they ought to go the same way on skirt, body, and sleeves.

It may be as well to remind you that what are called self-colours, and neutral tints, are becoming to everybody, while stripes ought only to be worn by short persons, and large patterns are never pretty.

To avoid waste of time you should endeavour to do your dressmaking in a quiet room, apart from the rest of the household, where you will not be required to clear all away whenever you have to leave it. If possible, too, you should secure the use of a large deal table, the commoner the better, and then you will not be in dread of scratching it with the scissors when you cut out. But be sure to wipe it carefully from time to time, to keep it spotlessly clean and free from dust.

You must begin with the skirt of your dress. So lay the material on the table, measure the proper length, and cut off the front width. Fold it lengthwise and slope it gradually to the top, for as you know, dresses at the present time have very little fulness at the waist. The next thing is to cut the gores, which is easy enough, if both sides of the material be alike, for then you simply fold the length crosswise from corner to corner, and cut it through. When you separate the pieces you will find that you have a gore for each side. But you must not forget to allow two inches extra in length, because the straight part, has to be joined to the sloped sides of the front width. When the material has a right and wrong side, lay a paper pattern on it and cut one gore. Turn this over to face the stuff, and cut the other exactly to it. Thus you will get a gore for each side. When there is an up and down to the material, as in velvet, velveteen, cloth, and other fabrics, with a raised pile or nap, the gores must be cut one beyond the other, and the parts left should be used for sleeves or similar purposes. If you remember that the pile or nap should always be brushed downwards, you will avoid mistakes in making up such materials. Two gores on each side the front, with a plain back width, will give the breadth of skirt now worn.

Be careful not to pucker the seams in putting the material together, and when they are all done lay the skirt on a table, and round the bottom nicely from back to front. Then line it to a depth of ten inches with Victoria lawn or some other stiff material. Many persons simply tear off the required quantity, selvage way, and make pleats where needed in putting it in. But it will sit smoother and look much neater if you cut it to the shape of the bottom of the dress.

Soft fabrics, such as merinos or cashmeres, are now generally finished with a kilting of the same, but velveteen should be trimmed only with silk or gimp. Pleat your skirt into a band, on the selvage way of the stuff, and line it with webbing to give it strength. Always cut the pattern of the dress-bodice first in lining, crease it to mark where the seams are to be, then tack it together and try it on. Having secured that it fits perfectly, take it to pieces again and copy it exactly in the material—thus. Lay the pattern of the front on it parallel with the selvage; on no account let it be the least on the cross, or you will spoil the sit of it. If the stuff be wide you will be able to get both fronts out of one width. The back must also be cut on the straight, and the present fashion is to have a seam down the middle. You can contrive the side pieces from what you take out of the hollows of the back.

Now tack the material carefully on the lining of each part, and then put the body together slightly. Try it on to ensure that it fits, and stitch up the seams. Remember that the firmer and closer your stitching is, the better your bodice will sit. Pare and overcast the shoulder seams to make them neat, but lay those under the arms quite flat, and run on some cases of lining or tape, each to receive a thin piece of prepared whalebone. This greatly helps to keep the bodice smooth. Then hem the fronts to the lining without letting the stitches come through. Finish the neck with a narrow band of material cut on the bias and neatly hemmed down on the inside.

You will find it best to make your buttonholes of tailor's twist, which is sold in all colours at one penny per yard. Take great pains with them, for bad buttonholes greatly spoil the appearance of a dress.

Just at present the bodices are worn perfectly plain, and young girls with good figures require very little trimming at any time. But it may be useful to you to know that trimmings across the body give width to the figure, while those put on lengthwise appear to diminish the breadth and add to the height. The sleeves must be cut on the cross, but down the material and trimmed to match the skirt. Be particularly careful to hollow out the armholes sufficiently before putting them in, or else they will pull and be very uncomfortable. Indeed, if you do not have all parts easy, they will soon fray and make the dress look shabby. You cannot take too much pains either in tacking or finishing off your work. The best dressmakers excel inferior ones in this respect quite as much as in style and taste.

Now a word or two about the fashion. Do not fancy that whatever is generally worn will, of course, suit you. Some girls, for example, admiring a costume on a tall, graceful person, unwisely copy it for themselves, and then are terribly disappointed to find that it does not look well on their stout little figures. Only very silly persons act as if they thought it "better to be out of the world than out of the fashion." On the other hand, if we dress in utter disregard of the prevailing style, we make ourselves equally ridiculous. So our best course will be to avoid extremes, and take heed to the injunction conveyed in the following couplet:—

"Be not the first by whom the new is tried,
Nor yet the last to lay the old aside."

Dress must be suitable to occupation and also to station in life.

It is quite possible, with pains and care, to modify and adapt various styles so as to make them becoming to ourselves, without our looking in any way peculiar. Many persons have no idea of harmony in their dress, and therefore array themselves in all the colours of the rainbow. But you will be wise to remember that quiet hues and sober tints mark a refined taste. Black, and various shades of grey, brown, or drab, enlivened with a coloured ribbon at the neck, are always becoming. But the hue of the ribbon should suit the complexion of the wearer. For fair persons, pale-blue, pink or mauve are best; and rose-pink, scarlet and violet for dark ones.

We should be especially careful that our dress is always suitable to our occupation. When engaged in active household duties prints are best to wear, because they will wash and look fresh. And they should be made of convenient length, not to trail on the ground and gather up all the dust and dirt as we walk about. Our appearance should be as neat when we are at work, as it is during our leisure. Nothing is more objectionable than to see a woman or girl performing her domestic employments, with a grimy face in the flimsy remains of her Sunday clothes.

Remember it is our duty to make ourselves look as well as we can; to be at all times clean and tidy. We ought to study dress enough to give others pleasure and to make ourselves so presentable to our loved ones, that they can find nothing in our appearance to offend their most refined taste. In this way we add to the happiness of our family circle. But a slattern, besides being a pitiable object herself, soon mars all the brightness of her home.

We are always most perfectly dressed when those around us are so content with the harmony of the whole, that they do not remark upon any particular part of it.

It is necessary to add, however, that directly we feel anxious to gratify our own personal vanity and love of display, we are beginning to think too much about dress, which is wrong, and we must check the failing at once or it will lead us into mischief. Again, we should endeavour to take as much care of our clothes as we can. Nothing is more untidy than a dusty dress soiled with grease-spots and stains. So if by accident you drop any on yours, remove them at once.

Some persons wear their garments to look well much longer than others, and, though very simple, their secret is worth learning. It is this. They brush their clothes, or wipe them thoroughly, to free them from dust, every time they take them off, and then hang them in a wardrobe, or lay them neatly in a box or drawer; so that they come out fresh whenever they are wanted. If you be wise, therefore, you will learn not only how to make, but also how to take care of your dresses; so that you can always wear them with comfort to yourselves and pleasure to others.

LESSON XXIII.

HINTS ON SHOPPING. ALWAYS BUY THE BEST ARTICLE OF ITS KIND.

DERIVATIONS.

Decision.—Conclusion. *Lat.* **dē-cīdo,** to settle.
Compensation.—Recompense. *Lat.* **com-penso,** to balance.
Durability.—Power of lasting. *Lat.* **dūro,** to endure.
Novice.—A beginner. *Lat.* **nŏvus,** new.
Impoverish.—Make poor. *Lat.* **pauper,** poor.
Flaws.—Blemishes. *A.-S.* **floh,** a crack or defect.
Suggestions.—Hints. *Lat.* **suggestĭo,** an intimation.
Disguise.—To hide by a false appearance. *Fr.* **déguiser,** to put a false coat or gloss on.

PRONUNCIATION. Exercise on sounds of *E* in

gray, grey, key, weight, speech, thread, deed, needle, bleat, sleep, sheep.

ALL girls and women are obliged to do more or less shopping, and to many it is a favourite occupation. But to be able to purchase wisely and well, is really an art which comparatively few are at the pains to master. Yet it is so very desirable that we should know how to lay our money out to the greatest advantage, that some hints on the subject may not be unacceptable to you.

You must remember at the outset, that you can perform neither this nor any other duty properly, without the exercise of much forethought, judgment, and common sense. Persons are often disappointed in their purchases, from the simple reason that they have spent their money without due consideration. They go into a draper's shop before they have made up their mind, either as to the kind of material, or the quantity which they need. Then, being bewildered by the number and variety of the goods there displayed, they are still more at a loss how to select. So, finally, after wasting the time and exhausting the patience of the shopman, they appeal to him to guide their decision. Under these circumstances it is just possible that he may be tempted to recommend the goods which he is most anxious to dispose of, without much regard to the benefit of his customers.

We sincerely hope that you will never do your shopping in such a careless, worse than thoughtless, way. If you wish to manage well, you must take the trouble to consider beforehand exactly what material is best, and how much you require for the special purpose. You will, of course, find this rather difficult to do at first; but by this time you must have learnt that a resolute will and a strong determination overcome many difficulties. Besides, if you are anxious to help yourselves, you will be sure to find some older and wiser friends at hand delighted to assist you with their advice and experience.

When you go into a shop, ask politely for what you want, but firmly and decidedly refuse to have anything else. We ought to be more regardful of the value of our own and other persons' time, and more honest, than to stop and look at twenty different things, not one of which we have the least intention of buying. If you cannot get what you want at one shop, you can at another. Therefore, never be talked into making an unwise purchase, because you do not like to leave a shop without buying something.

Always pay ready money for your goods, and then you will be free to deal where you know you will be well served. Then, too, you can afford to practise the only true economy, which is **always to buy the best of its kind, according to your means,** and never to be satisfied with anything inferior.

It has been wisely said that, both plentifulness and quality are secured by a clever economy; which consists less in actual saving than in spending well.

If you ask for credit and run bills, you lose your independence of action, you are limited as regards shops, and are at the mercy of whatever tradesmen will trust you. Then, of course, they cannot afford to wait for their money without some compensation; hence they are obliged to charge you a higher price for their goods than they are worth. Thus, you see, you would be great losers in the long run; for while with ready money you can buy in the best and cheapest markets, without it you must either take goods at the tradesmen's own prices or not at all.

Common sense tells us that honest tradesmen must ask a fair price for their goods, therefore never attempt to "beat them down." Be content with having your money's worth for your money, without expecting more. It is sad to think how greatly the unreasonable demands of the British public have increased the dishonest practices of trade. At any rate you must not be partakers in such a wide-spread evil. Your wisest policy is, first to learn what constitutes excellence in any garment or material, and then to purchase it at a first-class, well-established shop, where you can depend upon the quality of the goods.

Now, to enter a little into details, we may remark, that nothing is more important than that **our feet should be kept warm and dry.** Yet young persons too often, unfortunately, prefer showy and fashionable boots and shoes to those that are plainer and more serviceable. Many girls punish themselves a great deal by wearing very high heels. These cause the feet to pitch forward in a most uncomfortable manner, and render it impossible for the wearers to do more than hobble along, which makes them look very silly. We trust that you will know better, and that when you buy your boots you will take care that they are sufficiently loose to admit of the free action of your toes, and near enough to the ground to allow you to walk easily and comfortably. Remember also to have the soles of your walking boots sufficiently thick to resist wet.

It is at all times a mistake to buy cheap common boots. With a little wear they look shabby and begin to fall to pieces. Besides, they are often not waterproof, and damp feet are the cause of much serious illness and many early deaths. Strong leather boots, with clumped soles, protect the feet admirably in winter weather, though they are rather too heavy for summer use. There are differences of opinion as to the relative merits of boots buttoned, laced, or with elastic sides. For durability, perhaps those laced up the fronts will bear the palm, but the strings must be kept securely tied or they look very untidy. Shoes are not serviceable for out-door wear.

Stockings, too, require great care in the selection. Those which you knit for yourselves are best for cold weather, but woven ones are lighter and more comfortable in summer-time. Good unbleached, and Balbriggan hose, are very durable. Whenever you buy stockings, examine them thoroughly to see that they are well woven, that the heels and toes are double, and that the seam of the legs is made strong and regular. Do not waste your money in the purchase of openwork stockings, for they are very comfortless and not at all strong.

You must take pains to choose the rest of your wearing apparel well also. **Be determined to supply yourselves with a good stock of well-made underclothing.** This is of infinitely more importance than that you should possess a silk dress. But some judgment is required to choose calico wisely, for in these days it is so much stiffened with preparations of lime, in order to improve its appearance, that a novice may easily be misled as to its true quality. If you rub a corner of this calico in your hands you will see this "dress," as it is called, fly off in the form of fine white powder. Many persons say that the unbleached kind is stronger and more durable than the white, because the processes by which it is deprived of its colour necessarily somewhat impoverish the texture. As no doubt you have often heard, **good calico should have an even selvage,** and the threads should be uniform in thickness, closely woven, and free from knots and flaws. A very thin, loose make of calico, does not wear well.

In our changeable climate **flannel should always**

be worn next the skin; and you have already had some instructions about making it up. But be careful how you buy it. Careless purchasers are readily deceived in this material. There are many makes of flannel more or less desirable, but large numbers of persons prefer the Welsh variety on account of its warmth and durability. The chief point to remember is that **the truest economy is to buy the best.** The inferior kinds contain cotton. You may detect its presence by the harshness of such flannels to the touch, and they are neither so warm, nor do they wear so well as those made wholly of wool, which are soft and fleecy. In the lesson on Dressmaking you were told which are the best materials for dresses, but it may be advisable to add a few suggestions here.

First, you must remember that we ought to vary our garments somewhat with the season, wearing lighter shades and softer textures in summer, to be replaced by darker hues and thicker fabrics in winter. This is a more important matter than you may be inclined to think, for to be too heavily clad in warm weather is exhausting to the bodily energies; while to be too thinly clothed in cold weather, is productive of severe and sometimes fatal disease. Second, never buy what is called a cheap dress of fancy material, for you would find it very useless. Probably, feeling that you paid only a small sum for it, you would not deem it worth while to expend much time and pains in making it up. Then, as it is composed of a mixture of cotton and wool, a shower of rain will spoil it, and make it unwearable. These "fancy goods" are frequently manufactured of old materials rewoven, and hence it is not likely they will wear well. Yet so much profit is made out of them that we are scarcely surprised that they are so much pushed and puffed by some shopkeepers. Third, do not purchase a showy material, for a bright-coloured dress looks vulgar, and it will soon fade in the sun and become shabby. Fourth, as you have read before, prints and hollands are excellent for summer wear, with a nicely-made dress of alpaca for best; and darker hues of serge or other thick woollen fabrics for winter. Fifth, avoid all shams and imitations, and wear nothing that looks like what it is not. To be honest and real, and to be what you seem, even in your dress, is a noble thing.

By-and-by some of you may wish to purchase a silk dress. But be wise and wait until you can well afford to have a thoroughly good one, and then it will wear a long time, and will look well to the last bit. A common silk is most objectionable. Light shades and colours are very unserviceable, but nothing is more useful than an excellent dark or black silk.

Now a word or two about buying **gloves.** Lisle thread or spun silk for summer, and woollen ones for winter, are most suitable and economical for young persons. Best kid gloves are too expensive for every-day wear, and it is waste of money to buy those of inferior quality. Perhaps you may know by experience that the common kid, having little elasticity, generally cracks and tears, even in drawing the gloves on your hands. Hence they look old and shabby from the very first. Whenever you purchase kid gloves, examine them at the seams between the fingers, and at the strain of the thumb, to see that they are well made and without flaws. Be careful also to have them large enough to allow the fingers to move freely and to admit of their being buttoned at the wrist.

Before closing this lesson, it may be well to caution you against adopting any of the ugly head-coverings so fashionable at the present time, and miscalled hats. They afford no shade to the face, and are neither useful nor ornamental. Simple straw hats, nicely trimmed with velvet, satin, ribbon, gauze, or even white muslin and lace, according to the season, are very pretty and becoming to young persons, who generally prefer them to bonnets. Perhaps you are now clever enough to trim your own. If so, do not overload them; the simpler the style the better. Though they are unnecessary, still if you can well afford to spend money in this way and very much wish to add a small bunch of snowdrops, violets, primroses, rosebuds, or other small artificial flowers, there is no reason why you should not do so. Only remember that though a few will look very well, a large bunch will entirely spoil the appearance of the hat. And be very particular to secure the best possible imitations of the real flowers, for gaudy distortions of nature are most offensive to persons of refined taste.

STAGE II.

§ 1. THE DWELLING: ITS WARMING, CLEANING, AND VENTILATION.
§ 2. WASHING MATERIALS AND THEIR USE.

§ 1. THE DWELLING: ITS WARMING, CLEANING, AND VENTILATION.

LESSON XXIV.

DUTIES OF MAID-SERVANTS.

DERIVATIONS.

Exalted.—Raised. *Lat.* **ex-alto,** to raise or elevate.
Comprehensive.—Inclusive. *Lat.* **comprĕhendo,** to embrace.
Conscientiously.—Guided by a good conscience. *Lat.* **conscĭentĭa,** knowledge, feeling.
Respectable.—Worthy of esteem. *Lat.* **rē-spĭcĭo,** to have a care for.
Luxuriously.—With indulgence. *Lat.* **luxŭrĭo,** to have in abundance.
Responsibility.—Making a fitting return. *Lat.* **rē-spondĕo,** to offer in return.
Esteemed.—Prized. *Lat.* **æstimo,** to value.

PRONUNCIATION. Exercise on sounds of *EA*, *OU*, &c.
sweat, wheat, though, near, death, raw, slow, straw, few, leaf, sheaf.

WE hope that many girls who read this lesson will be wise enough to wish to become excellent servants, so as to have good posts in respectable families. But you will find the following lessons on household work exceedingly useful to you, whether you intend to adopt that, or any other course.

We suppose that all girls look forward to having the care of a household at some future time; and if so, they should remember that it will then be their duty to make all its inmates happy and comfortable. We strongly recommend you on this ground to pay particular attention to what follows. Do not forget that, even if you rise to a higher position in after-life, you will find it a real benefit to have a knowledge of all womanly accomplishments. We include under that comprehensive term, domestic economy; and how much greater will be its value if you have to earn your own living! If you keep a servant you will soon discover that in many things she is very inexperienced, and requires direction even in simple matters. And how can you teach her, if you know nothing about such things yourself?

But to return to the duties of maid-servants. Domestic service is a useful and honourable calling for girls who have to work for their living; and you should be most thankful for the great blessings of health and strength, which enable you to enjoy the privilege of thus becoming independent.

Neither will we make any comparisons between domestic service and other employments. We trust that your own good sense and judgment will lead you to select that for which you are best adapted. We may, however add, that none are more respected in their position than good, faithful servants; and if they do their duty thoroughly and conscientiously a blessing rests upon themselves and their work. Then in respect of personal advantages, they will always have good wholesome food, which will serve to keep them in health. Their wages paid regularly will supply them with suitable clothing; and will furnish something that must be stored for a rainy day. Last, and certainly not least, they will have a respectable and comfortable home.

One of our greatest teachers, S. Paul, wrote letters to the early Christian churches for their instruction. Among the various precepts which these epistles contain, are directions to servants. You will do wisely to read, think over, and act upon them.

It would be better, too, if we all oftener considered and practised the golden rule, "Do unto others as you would they should do unto you." Those persons who endeavour to live up to this rule, enjoy the peace of a clear conscience; which can never be gained except by upright, open, honest dealings with our fellows.

The qualities always sought in the "character" of a good maid-servant, are a natural disposition, to be well-mannered, kind and obliging, truthful and honest. She should be obedient, and not be above "being told." **Honesty is of the utmost importance.** This remark applies more extensively than upon a first impression we are apt to consider. When young servants find themselves surrounded by plenty, a temptation arises to be careless and extravagant. But you must recollect that wastefulness is a great sin, and really amounts to dishonesty; because it is depriving another of what is his. If another have plenty, that is no reason why he should be robbed.

Now it may be wise to say a few words about the special duties which belong to each class of servants.

We will begin with the **maid of all work**, or general servant as she is called, when only one is kept. She has really a very arduous task, for she is expected to understand, and be capable of doing, all household work. Industry and forethought are undoubtedly required in all positions; but it is most essential to one who is called upon to perform the variety of duties pertaining to the maid of whom we are speaking.

When there are two servants kept, the **cook** usually prepares the meals, and takes everything in the kitchen under her care; besides this she answers the door in the morning when tradespeople are likely to call, and assists the house-maid during the early part of the day.

The second servant undertakes the housework, and is styled the **house-maid.** Her duties are to keep the bedrooms and sitting, or drawing-rooms as it is fashionable to call them, tidy and clean; to set the table for, and wait at dinner; to prepare tea, and attend generally upon the family. In large houses, where several maids are kept, some are housemaids, others **parlour-maids**, who will most likely have needlework to do, and these take a share of the work.

If the family receive much company to dinner, or many visitors, under servants are employed in the kitchen and house. Those assisting the cook are called **kitchen** and **scullery** maids. It is an excellent plan for a girl who wishes to perfect herself in cooking to take service as kitchen-maid under a good cook, where she may learn the best methods of preparing food, and so subsequently rise to a place of greater trust.

Sometimes the mistress of the family is far too much occupied to attend to the arrangements of the house and the direction of the servants. In such a case a **house-keeper** is engaged, who acts then in the capacity of mistress to the other servants.

Wealthy ladies keep maids whose business it is to dress and wait upon their mistresses. **Ladies'-maids** are expected to be gentle and polite in manner, and to have a quiet, agreeable address; because they are brought constantly into the presence of ladies who would be annoyed by rough, uncouth behaviour. They also generally travel with the ladies, and attend them while visiting; so that folding and packing dresses and other clothing are important portions of their duties.

We must not omit the **laundry-maids,** who wash, and get up all the household and body linen; and the **dairy-maids,** who milk the cows, make butter and cheese, and are sometimes expected to make bread, biscuits, and cakes, but more generally have to assist in the work of the scullery.

Of course, when girls first go out to service they must begin in one of the subordinate positions, and be content with small wages. But if they take pains to learn their duties thoroughly, and perform them to the utmost of their ability; and at the same time show themselves to be thoughtful and industrious, obedient and honest, they will certainly receive consideration, and in due time rise to offices of greater trust. Then they will never fail to be both respected and esteemed by all those whom they serve.

They must remember that all mistresses like to see everything in their houses neat and clean; the furniture free from dust, the carpets well swept, and the ornaments carefully kept. Ignorance, indolence, and careless handling are common causes of mischief; and no one cares to be troubled with a maid possessing either of these bad qualities.

LESSON XXV.

THE NURSERY-MAID.

DERIVATIONS.

Regulation.—Rule. *Lat.* **regulo**, to rule or direct.
Judicious.—Able to judge. *Lat.* **judicium**, a trial.
Endowed.—Possessed of. *Lat.* **dos**, a gift.
Irritated.—Provoked. *Lat.* **irritābĭlĭs**, easily excited.
Detestable.—Hateful. *Lat.* **dētestābĭlis**, abominable.
Notorious.—Infamous. *Lat.* **nōtōrĭus**, making known.
Dependent.—Relying upon. *Lat.* **de**, from, **pendĕo**, to hang.

PRONUNCIATION. Exercise on *EA*.

deaf, bean, team, head, red, lead, dead, bread, great, a threat, cheap.

OF all servants, the **nurse-maid** has the most important and sacred trust committed to her. She has the training of her charges, at a period in their lives, when they require great care in the regulation of their food and exercise, in order that their bodies may be kept healthy; and much watchfulness, to correct bad habits, and inculcate good ones.

First impressions of the world are formed by the child chiefly through her; and hence it is very important that a nurse should be just, honest, obedient, truthful, and straightforward, as well as judicious in awarding praise or blame.

No person should ever attempt to be a nurse-maid unless she is fond of children, and is besides possessed of firmness, patience, and good temper. Little ones are exceedingly trying at times, and require wise management, because restlessness is quite natural to the happy, active spirits of childhood; and if the nurse be easily irritated, it is more than probable that the children will soon make similar displays of temper, for they are wonderfully quick imitators, and speedily copy habits borrowed from their elders.

The use of coarse language, or improper words in the nursery must never be permitted; they are always objectionable, but especially so when uttered in the presence of children.

Politeness, and general courtesy in manner, and speech to elders; and kindness and consideration towards companions, should be encouraged even in very tiny children. Young people should learn to treat everybody properly. Then they will not be likely to speak rudely to servants, or put household pets to pain. Cruel acts in childhood leave black stains upon the forming character; and these not unfrequently strengthen into habitual cruelty, and may be productive of detestable crimes in after years.

If there be a nursery pet of any kind kept for the amusement of the children, they should never be allowed to ill-treat it. Some poor little kittens have miserable lives owing to the thoughtlessness of the youthful tormentors, who diligently harness them to miniature carts, or play numerous other tricks calculated to worry and tease them. Then, when one of them in self-defence, inflicts a stratch upon a tiny hand or arm, it is often unjustly beaten, and the real culprit learns two bad lessons—first to be cruel, and then to be unjust.

All girls, whether going out as nurse-maids or intending to remain to help their mothers at home, should read the interesting chapter called "Minding

Baby," in Miss Nightingale's little book, entitled 'Notes on Nursing,' which can be bought for 6*d*.

In it she says that the seven chief requisites for a baby are the following:—

1. Fresh air.
2. Proper warmth.
3. Cleanliness for its little body, its clothes, its bed, its room, and house.
4. Food at proper and regular times.
5. No startling or shaking either to its body or nerves.
6. Light and cheerfulness.
7. Proper clothes in bed and up.

And management in **all** these things.

Cleanliness of body and clothing for an infant are also very important. You know well that the skin becomes soiled from perspiration, and doctors tell us that a very young child perspires even more freely than an adult. Hence the greater need for more frequent and careful washing of infants than for grown-up persons. Besides, a baby's skin is so soft and delicate that it soon chafes, and becomes painful unless it be kept spotlessly clean. Clean garments are most comfortable and pretty, but you must always recollect that washing is expensive if put out, and very laborious work if done at home. Therefore be particularly neat and orderly with the garments of children, taking special care not to crumple or tumble the clothes more than you can help in nursing; and never omit to fold up the tiny frock, pinafores, or other articles of dress when taken off the baby. Always see, too, that strings, tapes, buttons, and hooks and eyes, are in their places; and never be tempted to stick pins into an infant's clothing, unless the points are protected, as in the safety pin.

Now, some of you girls may be trusted to take the baby out for a walk, so be particular when it is a young baby to carry it lying easily across your arms, rather than sitting up; for it is bad for a little child to sit up too early. Shield the face from the cold wind and hot sun; remember that very strong light may injure the sight, and so possibly cause much misery in the future. If the child be strong enough to walk, try to make it take pleasure in trotting by your side, but never drag it by the hand or pull it sharply.

As you know, many persons use perambulators, and they are valuable in their way, but, unfortunately, they are sometimes greatly abused by thoughtless nurses. If you seat a child in such a little carriage, remember to look at it frequently, to make sure that it is quite comfortable, and be watchful to prevent any harm happening to it by your own carelessness.

Two dreadful cases occurred not very long ago, which we will relate now as a warning; so that you may be specially guarded yourselves.

The first happened not very far from London. A nurse-girl had the care of a poor little idiot baby, and used to take it out every day in the perambulator; but one morning, being far from attentive to her charge, she wheeled on and on without once thinking of the baby. At last a passing policeman sharply addressed her, and pointed to the child. To her horror, she found that it was dead, for one end of its long silken scarf had become entangled in the axle of the wheel, and, of course, every step she took but served to tighten it round the baby's neck until it was strangled.

The second occurred near Birmingham. Two little boys were trusted by their mother to take out two smaller children in a perambulator. All went well until the boy who was wheeling the little carriage released the handle to gather a flower from the river side. Immediately the perambulator started forward, ran down the bank into the river, turning over as it fell into the water. Long before a rescue could be attempted the unfortunate little occupants were drowned.

So girls can never be too thoughtful and particular when they are trusted with the lives of little ones. If you are called upon to fulfil such a duty, do your very best to discharge it well, and never on any account allow your thoughts to wander from the tiny being so helpless and dependent upon your care.

Remember the following rules, and carefully practise them.

Never read when you are in charge of children.

Never leave them while you talk to anyone.

Never go to any place whatever, except that for which you have express permission.

Never frighten the child by threats, or stories of black holes or bogies. Conduct of this kind is base and wicked. Do you remember the story in Standard IV. about frightening a child? If not, read it again, and remember it.

LESSON XXVI.

THE HONOUR OF EARNING ONE'S OWN LIVING.

DERIVATIONS.

Affluence.—Wealthy or easy circumstances. *Lat.* **ad**, to, and **fluo**, to flow.

Prejudice.—A feeling for or against beforehand and without due grounds. *Lat.* **pre**, before, and **jūdico**, to judge.

Proverbial.—Like a "household word." *Lat.* **proverbium**, a common saying.

Diligently.—Earnestly, lovingly. *Lat.* **dīlĭgenter**, industriously.

Frivolity.—Foolishness; any light, unworthy conduct. *Lat.* **frīvolus**, silly, empty, pitiful, sorry, worthless.

Facilities.—Easy means. *Lat.* **făcĭlĭtas**, easiness.

Intelligence.—Knowledge. *Lat.* **intelligo**, to exercise judgment, to perceive by the senses.

Political.—Relating to the government. *Lat.* **polĭticus**, relating to civil government.

Exhilarating.—Cheering. *Lat.* **exhilaro**, to gladden, make merry, rejoice, delight.

PRONUNCIATION. Exercise on vowel sounds in

three, to see, she, to be, a bee, a thigh, dear, beer, fourth, breast, you.

PERHAPS you wonder at the title of this lesson—"The honour of earning one's living," as if it could be an **honour** to work for daily bread. It is most true, however, whether you are surprised to hear it or not. Therefore since all, or most of you, are so happily situated that you will have to earn your bread hereafter, it may be well to say a few words about the honour of it.

You all know that GOD works incessantly, and sleeplessly, in creating and preserving the world for you. In so far then as you do honest and good work, with all your might, you are working for Him. That is a great honour in itself.

There is a vulgar prejudice in some people's minds, that those who do least, are the most to be honoured and admired; and that their state of life is above all others to be coveted. It is far, very far, otherwise. The most universally wretched people in the world are those who have nothing to do, and who do nothing. Why, they never have a holiday; and how would you like that? It is impossible, as you know well enough, to have a holiday which lasts always.

It very frequently happens that those who are born in affluence, so that they need not earn their bread, do more than those who have to earn theirs by the sweat of their brow. For work is not all of the same kind. There is work to be done with the hand, and work to be done, as we say, with the brains, or head; and in most cases this is far harder than the other. Then there are two sorts of work to be done by hand. There is work that does not soil the hands, and work that does; and we always find an excess of persons endeavouring to earn their bread by clean-handed work. Sewing, for example, is of this kind, and the bad pay earned by seamstresses is proverbial. The reason is that so many people try it. If half as many tried it, there would be about the same amount of work to be done, and the pay would be nearly double what it is now.

But work, simply as work, of any honest sort, if it be well and honestly done, is a pleasure, and carries its own reward. There is perhaps no keener joy in life than the experience of good hard work, well done, and brought to a successful issue. How proudly a girl feels, for example, when she says of a piece of excellent work, "I did that." This is quite a right and proper pride.

Those whose lives are passed in greater or less idleness or frivolity or pleasure, never had, and never could have, such a keen enjoyment as that. Idleness leads to crime; and one chief way to reform a criminal is to teach him or her an honest way of getting a living. Nothing palls upon anyone so soon as frivolity, and what is called pleasure. How would you like to make your dinner for a week, or a month, or a year or two, exclusively off sweets, good-stuff, or lollipops?

Those who work, help to increase the wealth of the country; those who do nothing at all, simply help to destroy what others make. It is commonly thought that money is wealth; but when you have read the lessons on Money in this book, you at any rate will know better. Houses and land, food and clothing, are wealth.

One of the greatest teachers of this age, and one who has the welfare of those who earn their bread very close to his heart, says this:—

"The wealth of a nation, and its peace and wellbeing besides, depend on the number of persons it can employ in making good and useful things. I say, its wellbeing also, for the character of men depends more on their occupations than on any teaching we can give them. The employment forms the habits of body and mind, and these are the constitution of the man."

"Whether as a body the English people employ their new political powers for good or evil, will depend, not on their facilities of knowledge; nor even on the general intelligence they may possess; but on the number of persons among them whom wholesome employments have rendered familiar with the duties, and modest in their estimate of the promises of life." [1]

The spread of education is good, but the extension of a determined will to do honest work would be better. It is sometimes said that the poor are being over-educated. If it can be shown that the honesty and cheerful attention to duty of those who earn their bread is diminished by education, then the reproach will be true—but not till then. Time was when all English men and women prayed that they might do their work well. And they did it. Time is when some of them try only how little they can do, and how badly they may do that.

It is the duty of women to aid men in winning their bread. The man is sometimes called the bread-winner, and he can win best when he is made most comfortable in his home.

There is work for all who will do it, if not in England, then in the colonies, which are eager to welcome young women of good character as immigrants. There is a healthy and exhilarating feeling in knowing, whatever may happen, that our bread at any rate is safe, because we possess both the power and the will to earn it. There was a maxim among the Jews that he who taught his son no trade taught him to be a thief; and Christianity may quite well adopt it as a fact. And in tho acceptance of earning one's living, it applies to daughters as well as sons.

Much nonsense is written and spoken now about women's rights. One woman's right, which is free from all nonsense, is, that she should on every account be proud to be self-dependent, both for her own sake, and for that of all with whom she may come in contact.

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[1] Professor Ruskin, 'Queen of the Air,' pp. 148, 149.

The character of her employment does not matter, provided only that it be honest; and we have spoken about the necessity of saving, and laying by for a rainy day, as the saying is, elsewhere.

Connected with the honour of earning one's own living, is the fact that everyone ought to do it. The lazy, the idle, the slattern, the good-for-nothing, should be obliged to work, and will have to be compelled to do so before long. We are gradually awakening to the fact that it is no part of the duty of working men and women to support the lazy ones. "Those undesirous of employment should of all persons be the most strictly compelled to do it."

Make up your minds, therefore, with the help and advice of your parents and teachers, how you intend to work for yourselves, and to win a place among good women; and, having made the decision, diligently prepare for carrying it out. Those who rise to a higher station in life than the one in which they are born, do it by making the most vigorous use of all the abilities God has given them. They prepare themselves for the work of to-morrow, by doing to the very best of their ability the work of to-day.

Any work which is **honest, useful,** or **cheerful,** and more especially if it be all three, is that whereby any girl may honourably do her duty, and get her own living, "in that state of life unto which it SHALL please God to call her."

Strikes prevent people earning their living, and are the cause of untold suffering on the part of helpless women and children.

Read these short notes on the masons' strike in London in 1877 and 1878, and then it is to be hoped you will never agree with anyone "on strike."

1. From the 'Times,' March, 1878:—

"THE MASONS' STRIKE.—The close of the masons' strike leaves for the present some 500 masons out of employment, who must be supported by the Union till they obtain work at the old wages of 9*d.* an hour. The strike has now lasted 32 weeks, and has cost the Unionists, who have been aided to some extent by those of other trades, somewhere about 30,000*l.*"

2. From the 'Daily News,' March 21, 1878:—

"THE LATE MASONS' STRIKE.—It is stated that since the close ot the masons' strike more than 200 of the men who were "out" have obtained employment at the old wages of 9*d.* an hour. The Strike Committee will still be obliged, most probably for two or three weeks longer, to pay weekly allowances to those unable to find work. The amount which the operative masons have expended on this dispute, and which they must now themselves acknowledge to have been worse than wasted, would have supplied each of the men on strike with 50*l.*, enough to have enabled a large number to emigrate to one of our colonies. Or, if the suggestion thrown out by Mr. Lucas had been thought of and acted upon by the men, they might, with considerably less than the 30,000*l.* which they havo wasted in a vain attempt to obtain an increase of wages, have established a co-operative building society which might have proved an efficient as well as thoroughly legitimate means of operating upon the labour market, and by conducting which they would have obtained such practical knowledge as would have enabled them to judge with greater accuracy of the fitness or unfitness of a demand such as that they persisted in for thirty-two weeks, at a cost of 1*l.* 11*s.* 3*d.* per week for every man engaged in it."

3. And this on the COST OF THE DURHAM STRIKE, from the 'Daily News' of June 2, 1879:—

"It is estimated that the loss in wages occasioned by the late strike of colliers in Durham amounts to 640,000*l.*, of which 240,000*l.* was borne by the men. Each miner has, it is said, lost 6*l.* in wages during the strike, in gaining 1¼ per cent. better terms than tho owners offered at first, 1¼ per cent. being 3*d.* in the pound. The colliers will have to work NINE AND A QUARTER YEARS to recover the 6*l.*, without reckoning interest."

LESSON XXVII.

KITCHEN UTENSILS, AND HOW TO TAKE CARE OF THEM.

DERIVATIONS.

Utensil.—Something for use. *Lat.* **ūtensĭlis**, useful.
Luxurious.—Lavish. *Lat.* **luxŭrĭo**, to have in abundance.
Requisites.—Necessary things. *Lat.* **rĕ-quīro**, to search for.
Inexperienced.—Unpractised. *Lat.* **in**, not; **ex-pĕrĭor**, put to the test.
Regularly.—Orderly. *Lat.* **rēgŭlātim**, according to rule.
Adapted.—Fitted to. *Lat.* **ăd-apto**, to adjust.
Valueless.—Without worth. *Lat.* **vălĕo**, to be of value.
Corrodes.—Eats away. *Lat.* **rōdo**, to gnaw.

PRONUNCIATION. Exercise on sound *EW*, in
a yew, a ewe, to chew, he knew, true, to brew, truth.

WHILE you are reading this lesson keep in mind the old adage, "Bad workmen find fault with their tools," and do not say because you have not all the utensils mentioned here, that it is impossible for you to become a good cook.

We will content ourselves with mentioning the chief things required to cook a plain dinner, adding a few directions as to the best way of cleaning the various vessels after they have been used.

Of course, the first necessity is a fire. We could not cook much without one; and to keep it up so as to be just suitable for carrying on the processes gently and regularly, is by no means so easy as some inexperienced persons imagine. A fire that has been recently lit, or one that has been allowed to get too low, or that has been fed with too large a quantity of coals, is not fit for cooking. A bright, clear fire gives out the most heat, and is therefore best adapted for preparing food.

The grate should be properly constructed and so well set as to allow of a free draught, because this will enable you to economize fuel. But do not forget to clear it out frequently, and polish it well; for a bright, clear stove gives out more heat than a dull, dirty one. The cottage kitchener, with its useful oven and boiler, is a favourite, and rightly, with good housewives.

When the much-coveted oven cannot be secured, a fairly good substitute is the **Dutch oven,** which probably you have often seen. It is very handy for cooking a chop or a steak, and of course the method closely resembles roasting. With care a light pudding or a small pie may be baked in it.

If you have to roast only small joints, it is not at all necessary to be provided with a bottle- or a smoke-jack. All that is really required is the exceedingly simple contrivance of a **hank of worsted** knotted here and there, and suspended from a **screw,** made for the purpose, and fixed to the mantelpiece. To the end of this the meat should be attached by a **large hook.** The only drawback to this contrivance is, that the meat requires constant attention while cooking to ensure that the joint turns round and round regularly. A **dripping-pan**, generally made of block tin, should be arranged below to catch gravy and the melted fat, and you should also have a **spoon** or **ladle** with a long handle for basting the meat.

Saucepans are absolutely essential articles in a kitchen, and you should possess at least three—a large one for boiling meat, making soup, or cooking a pudding; a middle-sized one for boiling green vegetables; and a smaller one for potatoes, rice, and other purposes too numerous to mention. Iron saucepans are strongest, and of these the cleanest for use are lined inside with a white enamel, readily washed. If you are fortunate enough to possess one of these, be careful not to leave it over the fire, or on the hot stove, if it have no water in it, for the heat will cause the enamel to crack and chip off. Saucepans should always be washed with hot soda-water, and be rinsed with clean cold water. You must wipe them as dry as possible, or they will soon smell sour. When you have cleaned them thoroughly, turn them down on a shelf until they are wanted again. The lids might be hung upon a nail above, or placed handle downwards upon the saucepans, so as to keep both together.

A **steamer** to fit over one of the saucepans is very useful, for it will enable you to boil a pudding in the water and steam potatoes above at the same time.

Copper stew-pans are, of course, more expensive than iron or tin saucepans. Copper is by no means a wholesome metal to employ in contact with food, and so vessels made of it are generally lined inside with tin. If you have any so lined, be careful not to use one in which the lining has worn away, or else it is quite possible for poisonous matters to become separated from the copper, and mix with the food you are cooking.

Earthen jars with closely fitting covers are excellent for making a stew in; they are commonly used for that purpose on the Continent. You may obtain the required heat for cooking the meat either by placing the closed jar in a heated oven, or in a large saucepan half-full of water, which must be kept boiling.

A **frying pan** is unfortunately a very common utensil in a working man's home. The general assertion is, that it saves trouble to fry the little meat or bacon that is wanted. But it is false economy, as frying is a very wasteful method of preparing meat. The frying pan is convenient for warming vegetables, and for making pan-cakes occasionally, as on Shrove Tuesday, but it is nearly valueless for every other purpose.

A **gridiron** will cook fish nicely, but a toasting fork answers the same purpose, and with less probability that the fish will become smoked, which spoils its taste. A toasted rasher of bacon is much more delicate in flavour than a fried one. And the fat or "dip," which most children like with bread, is never black and burnt, as it too often is when a frying pan is used.

Knives must be used for cutting up meat, peeling or scraping vegetables, and for many other purposes. You should always keep them well cleaned and bright. Use a knife-board for that purpose, with a little brick-dust; for though it involves more labour, the knives will not wear out half so quickly as if you employ a knife-machine. You should be particularly careful that salt does not find its way among the knives, or other bright steel articles, for it produces rust, and corrodes the metal. Take care too that a ring of dirt is not allowed to accumulate either on knives or forks, just where the blade enters the handle.

For stirring soups or stews, and mixing puddings or cakes, **wooden spoons** are best, because they can be scrubbed perfectly clean after they have been used. Other wooden articles required are a **pastry board** and a **rolling pin.** These should be scrubbed occasionally in some hot soda-water, and should always be spotlessly clean. You will be wise if you keep one side of the board for rolling pastry upon, and the other for cutting up meat, chopping suet, parsley, or other herbs.

Pudding cloths should be thoroughly scalded every time they are used; and when done with, should be washed carefully to remove every particle of food that may cling to the fibres. They should then be hung up to dry, and be well aired before they are put away, otherwise they will certainly smell musty, and communicate a disagreeable flavour to whatever is cooked in them.

And now a few words in closing upon the best methods of purchasing any of these utensils. It is by far the wisest plan to buy any article mentioned here at the shop of a respectable tradesman, and never from hawkers, who usually sell inferior goods at high prices. Be careful to select strongly made articles, too, for though they may cost a little more at first, the extra outlay will be more than repaid by their durability and the comfort you will find in using them. Remember that **cheap things** are mostly very dear in the end; and as this lesson began with a proverb, it may well end with another, " Cleanliness is a part of Godliness."

LESSON XXVIII.

EARTHENWARE, GLASS, CHINA, AND PLATE.

DERIVATIONS.

Ancient.—Of olden times. *Lat.* **antīquus**, venerably old.
Specimen.—An example. *Lat.* **spĕcĭmen**, a proof.
Dessert.—The last course served at dinner, fruits or sweetmeats *Lat.* **dē-servĭo**, to serve.
Toilet.—Applied to dressing-tables. *Fr.* **toile**, a cloth.
Individual.—One of a class. *Lat.* **in-dīvĭdŭus**, indivisible.
Exclusively.—Shutting out. *Lat.* **ex-clūdo**, to shut out.
Operation.—Something to be done. *Lat.* **ŏpus**, a work.
Culinary.—Belonging to the kitchen, or to cookery. *Lat.* **culīna**, a kitchen.

PRONUNCIATION. Exercise on sounds of *U.*

door, through, worth, further, Thursday, wool, full, bullock, to us, husband.

As you all know well enough, some of our most useful household utensils are made of earthenware or china. Vessels of this description have been in use from very early times, as you will observe when you read history. Or perhaps you may see some of the oddly-shaped jars and jugs in the collections of our public museums. From time to time, traces of the Roman occupation of Britain have been discovered in different parts of our own country, and among them numerous specimens of pottery of strange and fantastic forms.

In our own days earthenware can be bought very cheap. Prices of course, vary, from the common but durable stone-china plates and dishes, to the most delicate cups and saucers about as thick as egg-shells, which realize fabulous prices.

Our culinary operations would be sadly cramped without useful jugs, jars, basins, pie-dishes, and extra plates; and we should certainly be very much inconvenienced without the various articles for table use, not to mention the wash-hand basins and ewers of our bedrooms.

It is a common custom now to make services or sets for special uses; such as dinner, dessert, tea, or breakfast; chamber and toilet sets also for bedroom use. As, however, all the pieces of each set have the same pattern drawn upon them, you must take the greatest possible care not to break one, for you may find a difficulty in matching it.

We will now mention the chief pieces of which a **dinner service** consists. It includes a soup-tureen, or large, deep, covered vessel, with a dish upon which it stands. The ladle for serving soup is sometimes made of china to match. There are also large broad dishes for placing joints of meat upon. These sometimes have a little depression or pit at one end to collect the gravy. Smaller dishes for puddings or tarts, and vegetable dishes are also part of the set; and a certain number, generally a dozen each, of deep soup-plates, large meat-plates, and smaller ones for puddings, complete the service.

To wash plates and dishes you should use plenty of hot water in a dish-tub or large wooden bowl; because then the danger of chipping the edges is materially lessened. Plates and dishes should be rinsed first with boiling water, and this washing be kept for pigs, and never put down the sink, as the fat will soon collect in the pipe and clog it up. You should remember to put a little soda in the water for the second washing, because it greatly aids in removing the grease.

Carefully wash each piece on both sides with a dish-cloth of soft coarse hemp, removing everything that sticks to the surface; for it is very unpleasant to see a half-washed plate sent to table, with the remains of mustard or other matters clinging to it. Nothing is so offensive as dirt. Nothing is more pleasant than spotless cleanliness about everything we have to eat.

After you have thoroughly cleansed the plates, rinse them lastly in a pan of cold water, and place them into the plate-rack to drain. Always before using plates for dinner, rub them with a clean linen cloth, and set them near the fire to warm. Never use plates belonging to a service for warming food in the oven; the heat is too intense, and is apt to crack the enamel, and so spoil the appearance.

Tea and breakfast services are commonly employed. They consist of cups and saucers, of large size for breakfast, and smaller for tea; sugar and slop basins; milk or cream jug, large plates for bread and butter or cake, and smaller ones for individual use.

When you have to wash cups and saucers do not use such hot water as for plates and dishes, when grease has to be removed. The usual method is to turn each article round three or four times in the water, and then drain and wipe it. They do not require much rubbing, but it is as well to observe whether anything sticks to the inside, and wash it off while it is in the water. You should also be particular to cleanse round the handles of the cups, and when the tea has furred the inside of the cup or saucer, as it will sometimes, you may easily remove it by rubbing a little common salt on the spot. Greasy water employed in washing tea-things, or a dirty cloth used in wiping them, will make them feel sticky to the touch.

Glass articles, when well kept, should be quite bright and spotless They very readily show marks, even a warm finger being sufficient to leave a spot. Therefore be careful how you handle clean tumblers or wine-glasses. Be careful also to see that they are clean. If you are in doubt, hold one up to the light, and if it be quite clear and bright then it is clean; but if it be dull or streaky it is dirty. You must on no account put glass into hot water, or it is certain to crack, especially in cold or frosty weather.

Wealthy persons use many articles made of silver, such as dishes, hot water plates, spoons, forks, tea and coffee pots, besides other things of a similar character. These are generally classed under the name of **plate,** and require a great deal of labour to keep clean and bright.

After plate has been used, you must wash it in hot soap and water, with a little soda if necessary to remove the grease; then rinse it in cold, clean water and wipe it quite dry. Next polish it with a dry wash-leather and plate-powder, and finish with a clean leather kept exclusively for that purpose. When you can see your face in it clearly it is clean.

You should remember also to keep your tea, dessert, gravy, or other spoons beautifully bright, whether they are silver or plated. The best powder that you can use is a little prepared chalk or whitening. Thoroughly cleanse them from the chalk by careful rubbing, for few things are more unpleasant than a spoon with the flavour of the polishing material clinging to it, or with white dust left behind in the pattern.

For cleaning a Britannia-metal teapot, you cannot do better than rub the surface with a piece of woollen cloth, dipped in sweet oil and powdered rottenstone, until a polish is produced. Then wash the surface in hot soapy water, and finish it with a soft wash-leather and a little powdered whitening. The inside of the teapot should be well rinsed afterwards, to make quite sure that it is perfectly free from grit or paste, which is apt to fall in during the operation. Unless you do this you will find your first tea anything but pleasant in flavour.

LESSON XXIX.

SWEEPING AND DUSTING.

CARE OF FURNITURE AND ORNAMENTS.

DERIVATIONS.

Minúte.—Exceedingly small. *Lat.* **mĭnūtĭa**, fineness.
Deposit.—To lay down. *Lat.* **dēpŏsĭtĭo**, a laying down.
Noxious.—Hurtful. *Lat.* **noxĭus**, injurious.
Effectively.—Completely. *Lat.* **ef-fĭcĭo**, to execute or accomplish.
Sanitary.—Relating to matters preservative of health. *Lat.* **sāno**, to make healthy.
Note.—Sanatory, from the same root, means healing, curing.
Exterminating.—Utterly destroying. *Lat.* **ex-termĭno**, to banish.
Disperse.—To scatter. *Lat.* **dis-păro**, to divide.
Scrupulously.—To a nicety. *Lat.* **scrūpŭlōsus**, accurately diligently.

PRONUNCIATION. Exercise on sounds of *U* in

tusk, busk, dust, love, dove, above, hunger, tongue, drunk, son, sun.

HAVE you ever noticed a sunbeam streaming into a room, and observed the numberless motes sailing about its path? Now, whether the sun shines or not, motes of this kind are constantly floating in the atmosphere. They consist of minute particles of dust, both organic and inorganic in origin. When the air is still, these gently settle down and deposit themselves upon floors, walls, and furniture, in layers, which a cleanly housewife regularly removes by the two operations mentioned as the heading of this lesson.

With the ordinary dust of a large town many noxious ingredients are mixed, such as soot, and the products of decay given off by organic refuse. These may become fertile sources of disease, unless means are adopted to get rid of them quickly and effectively. Besides, while they remain they contaminate the air, and are productive of unhealthy odours.

Hence you see that we have strong sanitary reasons for the crusade against dust and dirt; as well as the sense of comfort conferred by cleanly habits.

The real object of sweeping and dusting is the removal of undesirable and injurious deposits. In order to accomplish this object perfectly, the dust must be **removed** and not simply **displaced.** Hence you should be particularly careful not to "raise the dust" in sweeping, by moving the broom too violently; for if you do the result so attained is a bad one. The dust only flies into the air and settles again as soon as you have finished bustling and allow it time, and you will have done more harm than good, in that case, by disturbing it.

Miss Nightingale says that, in her opinion, "the best way to remove dust from floors and walls is to wipe them with a damp cloth," because this deprives the particles of all opportunity to disperse themselves.

The following method of sweeping a carpeted room has been found by experience to be excellent. First, to prepare the room—pin up the curtains, open the windows, roll up the hearthrug and carry it away to be shaken, cover up all ornaments safely, and remove chairs and light articles of furniture to the middle of the room. After this preparation, strew some damp, not wet, tea-leaves round the sides, and carefully and lightly sweep all the dirt in one direction, either towards the door or to the fireplace; and pay particular attention to corners and crevices on your way. When you have completed the outsides, take up the used tea-leaves in a dust-pan, and place the chairs and furniture back against the wall. Next clear the middle of the room, and proceed to sprinkle fresh leaves. After they are scattered, be very careful not to step upon them, or you may stain the carpet, or even the wood. When you have repeated the sweeping with these, and have quite finished, take up the rest of the leaves and the dirt, and carry the dust-pan away at once, so that there may be no danger of upsetting it in the clean room.

Do not attempt to dust at once, but leave it to settle or escape through the window, and then take a soft linen duster, and proceed to re-arrange the furniture and ornaments. Remember that **a cotton duster is not good,** because it leaves a fluffy deposit behind it, and a room can never look tidy while there are flecks to be seen on tables and chairs.

Mind that you move every ornament, desk, workbox, book, or any such articles, for if you merely dust over the parts most in sight you will leave a line of dust round every object. Ledges, window-frames, projections of wainscoting, and similar parts of the room, must, whether in sight or not, receive special attention; for dust lodges and accumulates wherever there is the slightest support for it. Carved or ornamental portions of furniture must be particularly attended to, and you will find a dusting-brush a great aid in this part of your work, when the crevices are too small to allow you to introduce the finger. Picture-frames, gilt looking-glasses, and lustres, should be lightly dusted with a feather brush. The best duster for picture-glasses, mirrors, and delicate china or glass ornaments, is an old silk handkerchief. If you use this as a substitute for a duster there will be less likelihood of scratching their surfaces. When you have choice ornaments to dust, be scrupulously careful not to handle them roughly, or in a hurry; and if you be so unfortunate as to break anything, tell your mother if at home, and the mistress if in service, immediately.

Stiff curtains and similar hangings are specially liable to collect dust. They should therefore be undrawn and well shaken. Cushions, and furniture with stuffed upholstery, require an occasional beating in the open air with a small cane.

When the work of sweeping and dusting is completed, the room should have a fresh, bright appearance, with not a speck of dust visible in any part. Never grudge any amount of pains to secure a perfect result in whatever household duty you may have to perform. Whatever is worth doing, or has to be done, is worth doing well. "The world is a place for work. An idler is always a sinner. Happiness and virtue alike lie in action, at any rate, when action has for its object any part of human happiness."

LESSON XXX.

CANDLES, LAMPS, GAS.

CARE AND ECONOMY OF THESE ARTIFICIAL LIGHTS.

DERIVATIONS.

Artificial.—Made by man. *Lat.* **ars**, art, and **facio**, to make.
Substituted.—Put instead of. *Lat.* **sub**, under, **sto**, to stand **substituo**, to set or place next to, or instead of.
Announced.—Told, declared, proclaimed. *Lat.* **annuncio**, to bring news.
Invented.—Discovered, found out. *Lat.* **in**, in, and **venio**, to come.
Wick.—The part of a candle which "quickens" or catches fire. Cf. **quick** in quicksilver, quickset, quicklime.
Indurated.—Hardened. *Lat.* **induro**, to harden.
Expensive.—Costing much. *Lat.* **ex**, out, and **pendo**, to weigh.
Extravagance.—Foolishly great expense. *Lat.* **extra**, beyond; **vagor**, to wander.
Moderator.—Limiter. *Lat.* **mŏdĕro**, to keep within bounds.
Paraffin.—*Lat.* **parum affinis**, because it has so little chemical attraction for other substances.
Spontaneous.—Of one's own accord *Lat.* **spontĕ**, voluntarily.
Adjusted.—Arranged.
Complicated.—Many-folded; made of many elements; difficult to understand. *Lat.* **com**, together, and **plico**, to fold.
Gasometer.—A gas-container. *Gr.* **metron**, a measure.

Pronunciation. Exercise on sounds of *U* in

won, nun, under, hound, sound, a wound, it was found, (on the) ground, (corn was) ground, a pound (weight).

Part I.

There is a proverb which says, "Early to bed, and early to rise, makes a man healthy, wealthy, and wise." It applies to women as well as men. Those who live in towns as a rule retire to rest too late, and consequently shorten their lives. If we could all go to bed with the sun, and also rise punctually when he does, we should not need much artificial light; but though we cannot possibly manage this, the wisest make as close an approximation to it as they can. Still, many persons never get up in time to see the sun rise, and they thus wilfully deprive themselves of one of the grandest and most soul-stirring views in Creation. Poets are unwearied in singing about the glories of the rising sun; but readers are for the most part content to take them at their word, and thus they enjoy the pleasure only at second-hand. In the country, men and women are accustomed to rise at four or five in the morning, and go to bed at nine; and as a rule they are far more healthy than those who retire at eleven or twelve, or later, and rise at eight or nine. Some persons are not well alive until the candles are lighted, or the gas turned on, and thus not only is there a needless and terrible waste of light, but of life also. Remember it is just as much our duty to use artificial light economically, as it is to avoid waste in the use of any other of God's gifts. If we abuse a blessing we may perhaps lose it. We deserve to lose it at any rate.

Candles.

Candles are one of the oldest and commonest sources of artificial light, at any rate in country places, but in towns gas has been generally substituted for them. The English word candle is derived from the Latin *candela*, which means a light, such as a wax light, a tallow candle, a taper. You will be interested to know that in very early times candles were made thick, so that they burnt away slowly; and they were divided by means of tiny bells into hours, so that the end of an hour was announced, not by the clock striking, as with us, for clocks were not invented, but by the little bell falling into the metal dish that surrounded the candle. Candles are chiefly made of four kinds of materials, viz., tallow, composition, paraffin, and wax; while they are of two shapes, viz., dips and moulds.

Tallow candles are, as you would imagine, made of tallow, which is generally the fat of sheep; but that of oxen and other animals is sometimes used. We import large quantities of tallow from Australia, Russia, and South America.

Tallow candles are mostly **dips**, which are so called because they are made by dipping the wick into melted tallow, taking them out to cool, and then re-dipping them until the candle is of the required thickness. Dips are the cheapest candles, but they often emit a bad odour in burning. The number in a pound varies according to their thickness. This we express when we say, a pound of eights, tens, or twelves. Dips have a thick loosely twisted cotton wick, which requires frequent snuffing.

Composites are so called because they are composed of different materials, such as tallow hardened with arsenic, spermaceti, or other kinds of condensed animal oil. They are sometimes made of vegetable wax and thickened palm oil. They are generally shaped in **moulds**, have thin, carefully plaited wicks, and do not require snuffing. This is managed by placing in the wick an extremely thin metal wire, which causes the end of the wick to turn over into the outer edge of the flame, which gradually carries it away in the smoke as the candle burns. Candles should never, if possible, be carried about; as draughts cause them to gutter badly, and drop grease about, which is the worst possible form of dirt.

Wax candles are, or ought to be, made of either bees-wax or vegetable wax, but they are too expensive for general use.

When required to carry a tallow candle from one room to another, be very careful to snuff it first, and hold it upright and steady, so that grease may not drop on the floor or furniture. Use the extinguisher as soon as the need for the light is over.

Nightlights are thick candles prepared in boxes to burn a long time; so that from them a light may be instantly taken during the night if required.

Lamps are of many kinds, from a bit of wick floating in a vessel of oil, to the most elaborate moderator. The word *lampas* is both Latin and Greek, and means a torch or flambeau, i.e., either a piece of pine wood full of resin, which of course would burn brightly, or tow wrapped closely together and steeped in turpentine, which would burn still more brilliantly.

Lamps are more economical than candles, and generally afford a better light. The first and best rule to be learned about all lamps, is **to keep them clean.** Various kinds of oil are used in them, such as whale oil, common and sperm; colza or rape-seed oil; linseed oil; and of late years also rock oil, or paraffin, has been very largely used. So you see that oil for lighting purposes is furnished to man by the animal, the vegetable, and the mineral kingdoms. Paraffin is brought from the United States and Canada, and is now extensively consumed in Great Britain and other countries of Europe, and in Australia and elsewhere. It is cheap because it is very abundant, and inexpensive lamps have been specially made for burning it, with suitable chimneys and wicks. The coarser kinds give off an objectionable odour; especially if careless fingers, having first touched the oil in feeding the lamp, leave nasty marks on the glass. **Paraffin** is highly inflammable, and some forms of it are liable to explode unless great care is taken, and so are very dangerous. **Naphtha,** another kind of mineral oil, is sometimes used for outdoor lights.

You will have noticed how much more brilliantly the paraffin and other lamps of the kind burn after the "chimney," as it is called, has been adjusted. This is because just as much air is then supplied below as is required to convert the whole of the carbon in the liquid into carbonaceous vapour; nearly the whole of which is consumed, and produces a brilliant white light.

All persons agree that the best form of lamp is that called the **moderator.** But the drawback to it is that it consists of complicated machinery, which soon gets out of order unless it be most carefully used. It also costs more in use than paraffin and many other oil lamps. It received its name from a peculiar contrivance which causes the same quantity of oil to be always supplied to the flame, the flow being *moderated* or diminished by closing the outlet when the greatest pressure is on. The superfluous oil that flows over the circular wick, drops down again into the oil-vessel beneath. This constant and regular dropping is one feature of the lamp, and proves that it is in good order. But if you want to secure a good light the wick must be cut carefully and evenly round after every burning, and never with any but the specially prepared scissors. Watch closely also to see that no part of the charred wick falls into the oil-reservoir. Do not attempt on any account to light the wick with burning paper or a match, but use a wax taper for the purpose.

When you have properly trimmed the lamp, put the chimney and the glass globe on carefully, and then you may be sure to have a brilliant light. The lamp will need winding up once or perhaps twice during a long evening, and this, too, requires care, or the machinery may get out of order. There is one more caution needed as to the management of a moderator lamp, and that is, if you do not understand it, do not touch it at all. Learn first how to manage it from those who know.

Part II.—Gas.

Gas that is burnt in houses, shops, and streets, is obtained by distilling coal in closed cast-iron vessels, called retorts, which are maintained at a great heat. The brightest-looking coal produces most gas, but in order to drive it off faster, coke or a very hard Welsh coal called anthracite, is mixed with the gas-bearing varieties.

After being driven off, it requires to be collected, cooled, purified, and stored, before it can be distributed through the mains to the smaller pipes in houses.

It is collected by being passed through long pipes half-filled with liquid. It is stored or preserved for use in immense iron cylinders, called receivers, which are closed at the top and suspended by chains in tanks of water. You have most likely all seen these huge gasometers, as they are sometimes called. As the gas comes into these cylinders they gradually rise, and during the night when much is burnt, by degrees they sink down again.

It is almost impossible to make you understand how much gas is burnt in London alone, not to mention other great towns in England. About one million tons of coal are annually used in London for making gas, and there are between 3000 and 4000 miles of mains in the streets. But we are now (1878) told that gas for lighting streets, will soon be superseded by the **electric light**, which is much more brilliant, and gives off no poisonous gases. As yet, however, it is very expensive.

Gas is sometimes used to light railway trains, and very extensively for cooking and heating purposes, as it is very clean and easily managed. Gas stoves for heating rooms are unhealthy, unless due provision is made for good ventilation. Gas is generally considered the most economical of all artificial lights. One gas-burner, that will give as much light as three or four candles, will not cost so much as one candle. Every house where gas is burnt will have a meter or measurer, through which the gas passes into the house pipes, so that the proprietors of the gasworks may know how much is burnt. There is a little dial-plate in front, upon which, by means of very clever mechanism, the meter records how many cubic feet of gas have been consumed.

Although gas is cheap, yet it ought not to be wastefully burnt. Whenever a gas-light is not wanted the gas should be turned off. Gas is not nearly so healthy as lamps or candles, and on this account many people will not use it, either in sitting or in bedrooms. The products of its combustion tarnish gilding, spoil the bindings of books, prevent plants from flowering or growing well in a room, and soon make the atmosphere nauseous and unhealthy, so that a room in which gas is burnt requires thorough and constant ventilation.

Gas must never be played with. It ought always to be turned off at the meter at night, and then every burner in the house should also be carefully turned off. Fatal explosions have occurred from neglecting these precautions.

LESSON XXXI.

BEDS AND BEDDING.

DERIVATIONS.

Function.—Office. *Lat.* **functĭo,** a performing.
Purify.—To free from stain. *Lat.* **pūrus,** clean.
Saturation.—Filling with moisture. *Lat.* **sătur,** full, sated.
Tolerated.—Permitted. *Lat.* **tŏlĕro,** to endure.
Inexpensive.—Not costly. *Lat.* **in,** not; **expendo,** to weigh out money.
Enervated.—Deprived of nerve. *Lat.* **ē-nervis,** weak, nerveless.
Impoverishing.—Reducing to poverty. *Lat.* **paupĕro,** to make poor.
Subsequently.—Following in order. *Lat.* **sub-sĕquor,** to follow close after.
Vacated.—Unoccupied. *Lat.* **vācātĭo,** freedom.

PRONUNCIATION. Exercise on sounds of *U* in
some, come, ugly, sow (pig), fowl, but, butter, to put, up, cup.

YOU will readily recognize the great importance of directing attention to the subject of beds and bedding, when you consider what proportion of our lives is spent in rest. Few of us when in health sleep less than eight hours every day, or one-third of the twenty-four hours constituting day and night. Hence, you see, our resting periods include at least four months of actual time out of every year. Think of sleeping four whole months in every year!

It is a well-known fact, too, that during the hours of slumber, when the muscular part of the body is at rest, the excretory functions are more active, and the skin especially throws off much of its waste matter in the form of perspiration. This is, of course, absorbed by the night-clothes and bedding, so you will understand the great need for plenty of fresh air to purify and sweeten them.

Every morning as soon as we get up, the bed-clothes should be spread loosely over chairs, and in fine weather the windows thrown wide open at the top and the bottom, in order that the atmosphere of the room may be thoroughly changed.

Sheets and pillow-cases, which come closely into contact with the body, soon become soiled, and require regular and frequent washing. They should be changed at least once every three weeks; and the body linen never less frequently than once a week.

Iron **bedsteads** are more desirable, and far less clumsy than wooden ones. The price varies according to the size, quality, and ornamentation of the structure. They may be obtained from about two guineas to fifteen guineas or more. It is also much easier to keep away vermin by using iron bedsteads. In houses where such creatures are found great care should be taken to wash the bedsteads, mattresses, &c., with the proper poisonous preparations sold by the chemists to kill them. They may be kept under control. Those who suffer them to multiply unrestrainedly are intolerably lazy and unclean.

The fewer **curtains** and hangings employed about the bed the better.

Mattresses are very necessary and excellent articles of bedding, and some persons prefer them to feather beds. Nearly all who have tried the two prefer the mattress. There are many different kinds. **Spring mattresses** are highly esteemed. They are composed of a framework, within which are set coils of strong copper wire; the whole is covered with a padding of wool and the usual stout ticking. Another mattress or feather bed is usually placed on the top of this. Some mattresses are made of **horsehair** or **wool.** Such should always be brushed round once a week, and they ought also to be taken to pieces to be cleaned and remade every two or three years. Cheap cotton **flock** mattresses are also largely used; they are, however, not nearly so comfortable for resting upon, because the stuffing is apt to become lumpy and soon mats together. In the North of England, the cottagers use **chaff** to stuff mattresses. This is clean and wholesome, and as it is inexpensive can frequently be changed. In Wales well dried and sorted **moss** is employed, and in Scotland dried **birch leaves** answer the same purpose.

Feather beds are a greater luxury than mattresses, but are said to be less healthy. Nevertheless, many persons sleep on them, for they are exceedingly comfortable in cold weather. A feather bed is certainly not good in hot summer nights, for the mass of feathers renders the sleeper too warm for good rest or refreshing sleep. Sometimes during the hottest part of the year a mattress is placed on the top of the feather bed instead of underneath it.

The best feather beds and bolsters are usually stuffed with the small downy feathers of the goose, though those of other birds are sometimes employed. The most durable cases are made of a strong striped linen material, called bed-ticking, though an inferior quality made of cotton is often used. Whichever kind is adopted the wrong side should always be thoroughly waxed to prevent the feathers from working through.

At certain intervals, bed-ticks should be opened and emptied, the coverings washed and re-waxed, and the feathers purified before they are put back again. A cleanly housewife usually has double coverings to beds, pillows, and bolsters, so that the outside ones, which may be made of unbleached calico, may be slipped off and washed frequently.

If you are about to purchase a feather bed, you may test the quality of the feathers thus: Press down the bed with your hand, and if the dent made rises up quickly, you may decide that the feathers are good and downy; if they rise slowly, or not at all, you may know that they are of inferior quality. The same rule applies to all articles stuffed with feathers.

Blankets are indispensable bed-coverings, because they are such excellent non-conductors of heat, without being heavy. The number usually employed is three, one under-blanket to protect the bed by absorbing the perspiration, and two upper ones to form the covering.

It is always wise, when choosing new ones, to select those which are thick and heavy, and with a close pile. The Witney make is reckoned the best. A cheap kind of coarse blanket, known as the "Aldershot," may be purchased now. They can be bought either white or coloured.

The best and most expensive **bed-quilt** is made of eider-down quilted between silk. It is exceedingly light and warm, and imparts considerably more real comfort than a much heavier cotton counterpane. Some persons use their spare moments in knitting or crochet-ing quilts of cotton. These productions are heavy and cumbersome, both for use and in the wash. It would be much more to the purpose were they to make such coverings of good fleecy wool.

Patch-work **counterpanes,** though they answer the purpose of a coverlet, do not afford much warmth. If they are used in the winter, a very economical way of making them additionally valuable is the following:—**Line the wrong side with sheets of brown paper,** neatly stitched or pasted together, and tack over them an old calico sheet to act as a support and prevent the paper tearing. The warmth retained by a single layer is about equal to that of a good blanket.

List quilts are sometimes made by cutting flannel and cloth edging into shreds, and knitting them on coarse needles into strips, which may be subsequently sewn together.

Making a comfortable bed is a very important part of household work, and is by no means so common an accomplishment as we might reasonably expect.

Mattresses should be carefully turned upside down, and from head to foot, and be carefully smoothed. It has been already stated that extreme cleanliness and thorough airing of the mattress, bed, and bed-clothes are essential. Besides this, feather beds require good shaking every day, and the exercise is really most healthy if it be performed heartily; but a half-hearted shake is neither good for the bed nor bed-maker. Nothing half-hearted can be good. The best feather bed possible soon spoils if neglected, and becomes as hard or harder than flock, and not much more comfortable to sleep upon than a bag stuffed with cotton-reels.

As soon as it is stripped, the bed should be shaken briskly at each of the four corners. Two persons can do this easier and better than one, because they can stand at diagonal corners and shake alternately. Any knots in the feathers should be separated with the hands, and the whole then be left to air, for at least an hour. To have the beds made up as soon as they are vacated is not a healthy practice.

When you are making the bed, be sure to have clean hands and a spotless apron, so that the bedding may not be soiled.

First lay the bed so that it is as long and wide as the bedstead, but not unduly flattened; next, carefully arrange the clothes. These should be laid lightly over and tucked in at the sides and foot separately, the counterpane covering all. If you have made it properly, the bed will look nicely raised, and be an inviting resting-place to a tired person.

LESSON XXXII.

WATER SUPPLY AND DRAINAGE.

N.B.—Teachers will find much excellent information on this subject in 'Water' and other manuals of health published by the S.P.C.K.; in the 'Book of Food,' issued by the Kensington Museum, and in some of the tracts issued by the Ladies' Sanitary Association, Berners Street, Oxford Street.

DERIVATIONS.

Village.—A collection of houses larger than a hamlet. *Lat.* **villa**, a country house.
Preventable.—That may be hindered. *Lat.* **prævenio**, to go before.
Epidemic.—Falling at once on many people. *Gr.* **epi**, upon; **demos**, people.
Germs.—Beginning, seed, first principle. *Lat.* **germen.**
Regulation.—Rule. *Lat.* **regŭla.**
Sanitary.—Belonging to health. *Lat.* **sanitas**, soundness of body.
Local.—Belonging to the place. *Lat.* **locus**, a place.
Reservoirs, *Fr.*—Tanks or store-places for water.
Permanent.—Lasting always. *Lat.* **permănĕo**, to remain always.
Intermittent.—Occurring from time to time. *Lat.* **inter**, between; **mitto**, to send.

PRONUNCIATION. Exercise on sounds of *OU* in

south, mouth, uncouth, could, booth, a house, louse, thousand, a mouse, down (not up).

You have already had a lesson on **water** as a compound element, so that now we need only speak of the supply of fresh, and the ways of safely removing waste, water.

In country places there is hardly ever much difficulty in obtaining fresh water, except indeed in salt marshes close to the sea; and on the chalk wolds and downs, where it is sometimes extremely scarce. No one knows how valuable pure water really is, unless she has experienced what is meant by a scarcity of it. When water has to be carried for miles in carts, people discover how precious and all-important it is. Running water is, as a rule, good, but the stagnant water of ponds ought not to be used, either for drinking or cooking. In the country, most people who have a little garden have their own well or pump, and if it be certain that no sewage matter can drain into the well, then this source of supply is excellent. In very small villages there is occasionally a parish pump which supplies everybody.

A pump is better than an open well; because when a pump is placed over it, the mouth of the well is closed, and refuse is thus kept out. The best wells are not less than 50 feet deep, and as a rule the deeper they are the purer the water will be, although the work of pumping it up will be proportionately more difficult. Tanks are made in some places to store up the rain water for use in time of drought. There is one fact which cannot be too often repeated, or too carefully remembered, namely, that a large number of epidemic diseases are caused by impure water. Persons who drink foul water, take in with it the seeds or germs, or causes, of sickness.

In towns, water is mostly supplied by **water-works**, which are under the regulation of the sanitary authorities, the local boards of health, &c., so it may be hoped that all, even the poorest, have what they cannot do without, viz. pure water. The different waterworks companies have cisterns, or reservoirs, in suitable places, from which the mains are laid. If the reservoirs be higher than the highest point of delivery of the water, no pumping is required; for water always rises to its own level in flowing through closed pipes. But if the reservoir be not elevated, or if the source of supply be a spring, or a river, then the water has to be forced upwards in the mains by strong pumping engines. In some towns the supply is permanent, that is, the water is always **on** at the tap. In others it is intermittent, and only on for a few hours in the day. This difference is owing either to expense or to abundance of source-supply. If the supply be plentiful, near, and require no expensive pumping works, then most likely the water will be always on; and this is a great convenience as well as a real blessing. If, on the other hand, the source of supply be distant, or not abundant, or require very expensive engines and pumps, then it will not be on all day. In any case, in towns, the pressure is always on, in certain mains, for fire purposes. When the supply is intermittent, some must be stored in water-butts or cisterns. These should be regularly cleaned out, and the top should be carefully covered, or soot, dust, and particles of other matters will be sure to find their way into and corrupt the water. Wells in towns are nearly all bad, owing to sewers and other causes. They can be forcibly closed by the sanitary authorities. It may seem hard that the inhabitants of towns should not be allowed to draw water from their own wells, but it must be remembered that the whole population has to be considered. If from drinking foul water one family in a street sicken with typhoid fever, cholera, or gastric fever, these diseases are prone to spread. Therefore the supposed convenience of one, must give way to the safety of the many. It is generally found necessary to fill up the forbidden wells, because if they were left open for use in washing, cleansing, &c., some one from laziness, carelessness, or simple obstinacy, might still use the water for food purposes; and thus the evil would only be nursed instead of being killed. In towns, of course, water has to be paid for by the **water-rate,** whereas in the country it is mostly free.

We have now to see how water that has been employed for washing and other necessary purposes can be safely got rid of. Every house requires to be daily relieved from slops and waste water; and the health of the inmates is very materially influenced by the plan of this removal. How often we hear the complaint that the drains are bad. Sometimes on entering a small house in town or country, the first word that arises to a visitor's lips is "Drains! bah!" If the father, and mother, and all the children of a large family be ill, and we ask why? the reply very frequently is "drains," i.e. the **proper answer,** for the *word* answered will most likely be "fever" of some sort.

In the country, drainage is easy enough, when every house has its own garden. All that is required is a little care, because even an open drain, if kept periodically cleaned out, will not be very dangerous, provided it be quite away from the well. But if there be much standing water, then the drainage is faulty, and had better be attended to, before a fever or some other complaint compels attention.

In every town now, there is a more or less perfect system of drainage. The subject of sewage, and the utilization of sewage matter, and schemes for complete drainage, are being perpetually discussed. Large towns, as a rule, are well drained. If, therefore, any disease arise from sewage matter, it is the fault of the inhabitants of houses who have not connected themselves properly with the main sewers, or else are dirty in their habits, and mismanage their own connecting pipes.

Let us say a few words about those places that need special attention in this matter. First the **sink.** All the washing, cooking, floor-washing, plate and dish-washing waters will be poured down the sink. There will probably be another outlet for slops. If not, they must go down the sink. Now, the rule to be observed about the sink is, **Never remove the perforated plate or cup from the top** of the pipe. When waste water is poured down, any pieces of solid matter will be stopped by it, and they should be carefully collected and buried or burnt. Lazy and ignorant servants frequently take off the plate and let everything go down. The result is, that there is soon a stoppage, then a bad odour, and then the drain must be opened before it can be set right. This is a matter of trouble and expense, and might have been avoided had proper care been taken. After washing up, the sink should be flushed with clean water. Everyone ought to see that fatty matter does **not** go down the drain, for it will clog the sides of the pipes sooner or later. Plates, &c., should be well scraped, and roughly cleansed of grease with boiling water before being washed at the sink. These first washings make excellent food for pigs. If only a very little fat get down, it may be cleared by pouring down hot water with a strong solution of soda. Drains should also be flushed with Condy's fluid from time to time, as you will find described in the lesson on Disinfectants. Water-closets should be kept flushed with clean water. If privies be used, the further they are from the house the better, and they should be emptied frequently and regularly. They may, however, be kept fairly sweet and pleasant, if fresh dry black earth be put into them every morning.

Water-closets need very careful attention. They get out of order mostly by having improper substances thrown down by idle or careless persons. They should be flushed with clean water, and with Condy's fluid from time to time. It is a good plan to keep a pan of charcoal in them, or a saucer of chloride of lime, or of any other disinfectant, for occasional use. The window should always be kept open, if there be a window to the outer air, as there ought to be. The drain-pipes leading from closets should be carefully trapped. A trap allows waste water to pass in the direction of the main sewer, but does not permit the bad sewer gases to come back again to the house, unless indeed very strong backward pressure is applied to them. A closet may be doubly trapped by a bend in the pipe, so that there is always a layer of water as well as a trap between the foul gas and the house. A third security is to have a small iron or other pipe, connected with the closet-pipe just beyond the water-trap and carried outside the house nearly or quite to the top of the roof. In this case it is very difficult for any bad gas to get into the house.

Cesspools are death-pits, and are gradually being abolished. Places where domestic animals are kept ought to be well drained and regularly cleaned out. If, after all proper care and attention, there be still an offensive odour, the remedy is to send for the sanitary officer, or the inspector of nuisances, or both, and not to rest until the cause has been discovered and removed.

§ 2. WASHING MATERIALS AND THEIR USE.

LESSON XXXIII.

THE LAUNDRY. WASHING DAY.

DERIVATIONS.

Poisonous.—Deadly. *Lat.* **pōtĭo,** a poisonous draught.
Abhorred.—Detested. *Lat.* **ăb-horrĕo,** to shrink from.
Absorbed.—Sucked up. *Lat.* **ab-sorbĕo,** to swallow.
Adhere.—To cling to. *Lat.* **ăd-hærĕo,** to hang to.
Curiosities.—Strange things to be inquired about. *Lat.* **cūrĭōsus,** inquiring anxiously about.
Apparent.—Visible. *Lat.* **appārĕo,** to be evident.
Propagating.—Multiplying. *Lat.* **prŏpāgātĭo,** an extending.
Necessitating.—Making compulsory. *Lat.* **nĕcessārĭus,** indispensable.
Tragic.—Fearful. *Lat.* **trăgĭcus,** terrible.
Culpable.—Guilty. *Lat.* **culpābĭlis,** worthy of blame.

PRONUNCIATION. Exercise on sounds of *O*.

town, brown, room, rough, to bow (bend), a bow (archery), shroud, out, proud.

DOUBTLESS you remember the proverb already alluded to—"Cleanliness is a part of Godliness." It is also most certainly a part of healthiness.

In our English homes of this nineteenth century, washing day is an established custom. In badly managed houses, however, the bare mention of it is sufficient to frighten the fathers and brothers, before whose minds rise visions of the disagreeable steam, soapy odours, and general discomfort, which experience has taught them to expect on such occasions. But much of this may be avoided by tact and careful management, such as should be employed in all branches of household duty.

The garments worn next the skin are those which require most frequent washing, because the skin, as an excreting organ, is constantly giving off a quantity of waste matters in the form of perspiration. This is, of course, absorbed by any garment which comes in contact with the surface of the body. Hence underclothing soon becomes soiled, and requires changing once or twice a week, according to the occupation of the wearer.

Invalids and sick persons, especially those suffering from fevers, or other infectious diseases, require very frequent changes; because the matters which pass from the skin of such people are more poisonous than those which are thrown off from the body in a healthy condition.

The washing day usually comes once a week in ordinary households, but when the family is small, the housewife sometimes prefers to go through the process of washing once a fortnight. Soiled clothes should never be left longer than this, or they will smell disagreeably, and become a bad colour, besides being more difficult to get clean when they are washed.

Perhaps some of you have heard the old-fashioned rhyme about the best day in the week to wash, beginning—

"Those who wash on Monday
Have all the week to dry."

Of course you understand that what this really implies is, that the work of the week should be so well arranged as to provide ample time for the thorough completion of each process. Only "shiftless" persons, such as Aunt Ophelia, in 'Uncle Tom's Cabin,' abhorred, dream of continually putting off the evil day, until Saturday arrives, and necessity compels them to wash out a few things for Sunday wear.

In the reign of Queen Elizabeth, before cotton fabrics were invented, it is said that the poorer classes clothed themselves in coarse woollen garments, which were **never** washed, but were worn day and night until they dropped to pieces.

Persons of rank wore rich silks and velvets. It was out of the question, of course, to wash these materials; and so, if from long use they became unsightly, they were handed over to the dyer, who hid the dirt and discolour under a coating of some more brilliant hue. But you can imagine what unpleasant odours were attached to them, from absorbed matters which could not be got rid of by these means. No one, rich or poor, ever wore underclothing; so whatever the material of the outside garment, it had the full benefit of all the dirt that could adhere to it.

When linen shirts were first made, they were looked upon as great curiosities, and one was deemed a suitable gift for a sovereign. As linen goods became cheaper and more generally used, the necessity for their being occasionally cleansed also became apparent. But even then, once or twice a year was considered quite often enough for the great business of washing.

With the wider spread of civilization, and the invention of improved manufactures, linen garments were gradually more extensively adopted. In our great-great-grandmothers' time, it was not unusual to estimate a woman by the amount of sewing she had accomplished during her lifetime, and the number of garments she had completed with her own skilful fingers. Then, too, as the washing seasons came round only at intervals of six months, it was quite necessary to have many changes of linen instead of the one or two dresses, formerly required.

You may be interested to have a short account of one of these semi-annual washing periods. The spring and autumn were the seasons selected, and hampers of dirty clothes were carried down to the banks of some river. The garments, after having been washed in the running stream, were spread out on the banks to bleach, and they must have required this after having lain so long in a soiled state. When the whole wash was completed, the workers concluded the ceremony with a dance and festival, much like those of our harvest homes.

On the Continent, at the present time, much washing is done in rivers and streams. In England public washhouses have been established in large towns, to the very great benefit of poorer people.

Some give the Americans the credit of being the first to introduce the practice of a weekly wash at home; but plenty of cleanly English people know that this is not true. There are, of course, many persons engaged solely in the occupation of washing, both in private and public laundries. A good washerwoman, and a good laundry-maid, are always sure of plenty of employment and good wages.

Some of the wealthy prefer to keep servants specially as laundry-maids, and some middle-class persons engage a washerwoman by the day, rather than send their clothes where they may be mixed with others, and may possibly come in contact with body linen of those who have been suffering from some infectious disorder.

The following extract from the 'Times,' in the spring of 1878, will show the desirability of such precaution. The French word *rôle* means, part:—

" A Fatal Laundry.—An illustration of the dangerous *rôle* in propagating disease which the laundry occasionally plays, was given at a recent meeting of S. Olave's Board of Works in London. The medical officer of health reported that a serious outbreak of typhus fever had occurred at a certain yard, necessitating the removal of five persons to the hospital. On making inquiries, it was found that a young woman who lived with her mother and brother at one of the houses, brought home from the "other side of the water" some clothes to be washed which had been worn by a patient suffering from typhus fever. The consequences were immediate and tragic. The two women, the man, and two neighbours were attacked, and four out of this number died in hospital. The house was at once closed, and most of its contents burnt, while the Board very rightly directed the medical officer to make further investigation into the circumstances of the fatal importation. We trust the inquiry will be thorough and complete, and will result in the detection of the culpable parties. A published account of the whole affair will, after a time, be desirable."—*Lancet.*

LESSON XXXIV.

WASHING MATERIALS.

SOAP; HARD AND SOFT WATER; SODA; BLUE; STARCH.

DERIVATIONS.

Impurities.—Foul matters. *Lat.* **impūrus**, unclean.
Exude.—Give out. *Lat.* **ex**, out; **sūdo**, to sweat.
Emollient.—Something which softens. *Lat.* **ē-mollĭo**, to make soft.
Appreciate.—Value. *Fr.* **apprécier**, to set a price.
Combines.—Unites. *Lat.* **com-bīno**, to join together.
Preference.—Choice. *Lat.* **præ-fĕro**, to place first in esteem.
Crystalline.—Transparent. *Lat.* **crystallĭnus**, made of crystal.

PRONUNCIATION. Exercise on sounds of *O* in

cough, sought, wrought, daughter, bought, brought, thought, world.

CLOTHING requires to be cleansed from the perspiration, dust, and dirt, which cling to it.

Now you have read in former lessons that perspiration consists of watery, fatty, and other matters, that exude through the skin. You know, too, perfectly well, that water alone will not remove greasy impurities; and so we use soap with it, because the alkaline constituent of **soap** has the power of rendering them soluble. You may perhaps be interested to learn a little about the making of so useful an emollient, which at the present time is a cheap article, within the reach of everybody. Its valuable cleansing properties have been long known, but the manufacture has been much improved during the last century. It has been said that soap materially aids civilization; so we are not surprised to hear that England ranks foremost in its manufacture, although the necessary ingredients are mostly imported. All English children should show that they appreciate this distinction, by always appearing with clean hands and faces.

Soap consists of an alkaline substance which combines readily with a fatty acid, in such a way that the compound is soluble in water. The dissolved substance and soap cause the cloudy appearance of water, after you have washed your hands with soap; and that of soap-suds after the clothes have been washed.

Both animal and vegetable oils are used in the manufacture of soap. The chief animal fats used are tallow, whale, and seal oils; and the chief vegetable oils are palm, linseed, and cocoa-nut oils. The alkalies employed are soda or potash. The last-named is much the stronger, and when added to coarser fats, a soft, jelly-like substance is produced, which is known as **soft-soap.** This is celebrated for its sharply penetrating qualities, and hence is employed for cleansing very dirty floors or woodwork, but it seldom appears in the laundry. **Hard and compact soaps** like the common yellow, mottled, and curd soaps, are made of soda, mixed with more refined fat. The curious streaks, which have given the name to the mottled variety, are caused by stirring in certain mineral matters during the cooling process. It is worth your while to remember that **soap should be purchased some time before you want to use it.** The best plan is to buy at least a bar, or about 3 lb., at a time, and cut it into squares with string, and stack the pieces so that the air can circulate round them and so dry them. A more shiftless and uneconomical practice cannot be conceived, than that of purchasing soap from the grocer as it is required, for then it is moist, and "lathers away" very quickly.

You have read of the terms **hard** and **soft** as applied to **water**, and you will remember that soap does not readily make a lather in water containing lime and some other mineral matters. Now, in order that clothing may be thoroughly cleansed, soap should be free to combine with and so remove the grease and dirt in the garments; and it ought not therefore to be made insoluble and useless by mineral ingredients. So, you see, there is a good chemical reason for the preference laundresses give to soft, or rain water.

In order still further to soften the water used in washing, and also to increase its cleansing properties, free **soda** is employed. This is sometimes obtained from the ash of plants growing near the sea, but large quantities are now produced by chemical means from sea-salt; its manufacture is indeed an important branch of industry in England.

Always keep soda in a dry place, because if it become damp it loses some of its useful qualities. A stone or earthenware jar with a cover is the best thing to hold it. Both soap and soda are apt to impart a yellowish tinge to white textile fabrics, to counteract which it is customary to rinse all garments or house-linen in blue-water.

Many kinds of **blue** are now advertised as good, but for ordinary use the old-fashioned stone-blue cannot be surpassed. It is sometimes known as thumb-blue, from the curious shape of the ounce packets sold, which appear as if dented with the finger and thumb.

Blue is made by mixing and moulding indigo and Prussian blue into cakes of the required size. If any garments have been lying by for some time, and have become yellow, the best way to bleach them is to wash them in the ordinary way, rinse in blue-water, and then dry them in the open air, having repeated the rinsing and drying several times. If possible, they should be spread on a grass-plat in the sun.

Some garments require to be stiffened in order that they may be more easily ironed, and that they may keep clean longer when worn. For this purpose **starch** is used. The things usually requiring it are washing dresses, such as cotton prints, and muslins, white skirts, cuffs, and collars.

Laundresses' starch is prepared chiefly from potatoes, wheat, and rice.

Many persons prefer rice starch to all others, because it leaves a good gloss on the surface of the article and the stiffness remains longer in damp weather.

You may buy either white or blue starch, the colour in the latter being caused by the use of indigo or ultramarine.

It is well to remember that starched articles are apt to stick to the iron during the process of ironing; so to prevent this you should melt a little pure white wax or very clean tallow in the water before making the starch, and if you add a little powdered borax it will increase the stiffening power for cuffs and collars. This is how clear-starchers obtain their excellent results.

LESSON XXXV.

MACHINES EMPLOYED IN WASHING.

DERIVATIONS.

Contrivance.—An invention. *Fr.* **trouver**, to find.
Ingenious.—Clever. *Lat.* **ingĕnĭōsus**, clever, able.
Exhausting.—Wearying. *Lat.* **ex-haurĭo**, to draw out.
Exertion.—Labour. *Lat.* **exsĕro**, to put forth.
Appliances.—Contrivances invented for a special purpose. *Lat.* **applĭcātĭo**, attaching oneself to.
Object.—To disagree. *Lat.* **objectus**, a putting against.
Complex.—Intricate. *Lat.* **complector**, to entwine.
Ruined.—Destroyed. *Lat.* **ruīna**, a falling down.
Superseded.—Stayed. *Lat.* **super**, above; **sĕdeo**, to sit.

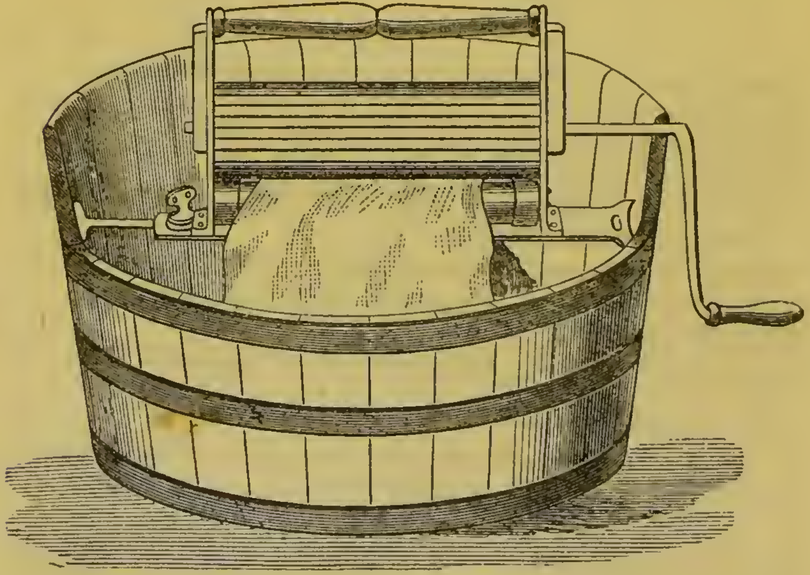
PRONUNCIATION. Exercise on sounds of *O* in

horn, corn, storm, hoard, word, ford, board, hole, holly, foal (colt).

VARIOUS contrivances for lessening hand labour are now common in every branch of industry, and some exceedingly ingenious machines have been constructed to relieve laundresses from the necessity for much of the exhausting exertion in rubbing and rinsing clothes.

We will begin with a few words about **washing machines**, of which there are various kinds. The one called a **dolly** was first invented and used in the North of England. It consists of a handle, a shaft, and some spoke-like projections, almost like a five-legged stool, attached to the bottom of the shaft. It is employed to beat out the dirt in clothes, by working them up and down, and twisting them about as they lie in a large tub of hot water.

A far better machine has been invented in America. It is made so convenient for use that it will fit into any ordinary tub just as you see in the little picture, which is a representation of the **Canadian prize washing machine.** A piece of the tub is supposed to have been cut away so that you may see the whole of the machine and how it is put together. It is worked as follows:—By the application of pressure, clothes are forced over two small rollers, and under a large fluted one, which is turned by a crank handle; and in this way the dirt is rubbed and squeezed out. By means of a small thumb-screw on the left side of the roller, the bottom may be made to increase or decrease



in length so as to fit into tubs of all sizes. This machine has another advantage, which is, that it is easily worked; and being simple in construction, is not so liable to get out of order as a more complex arrangement.

Wringing machines are also useful, and the saving in wear and tear to the garments in consequence of their use is said to be very considerable. The old method of twisting clothes tightly with the hand to squeeze out the water, is apt to stretch and break the fibres of the fabric acted upon. A wringing machine usually consists of two indiarubber rollers, which press together so evenly, that the finest articles may be wrung without injury. It is specially valuable too for woollen garments, because by the smooth and even pressure of the rollers the water is forced out of them without injury to the material. Flannels would be totally ruined by tight twisting.

Drying and airing machines have been invented to take the place of the accustomed lines and posts for outdoor drying, and of airing horses used indoors. One kind is like an inverted umbrella between the arms or ribs of which lines are stretched. The machine may be easily closed when not in use, and opened with a rope attached to a pulley when required for service. The wind causes the machine to revolve, and as a free circulation of air is thus kept up all round them, the clothes dry much more quickly than when simply pegged to the lines.

In large institutions or public laundries, drying presses or hot closets are sometimes used. These are certainly exceedingly valuable in bad weather, but clothes are never so fresh as when dried out of doors. Nothing can ever be so efficient as fresh air and sunlight, for sweetening and purifying linen.

The machines for smoothing and finishing off garments are of two kinds.

The **mangle,** as you know, is a heavy, cumbersome machine, used to take the creases out of damp linen by subjecting it to an immense pressure.

Most articles are still further improved by ironing, and for starched garments hot **irons** are indispensable. You are perfectly well acquainted with the appearance of the ordinary flat-iron, which has been in use for a very long time. You know too that it is difficult to keep a regular supply of irons sufficiently hot to give the clothes a perfectly smooth gloss, with a common open fire. Portable ironing stoves are a great boon to laundresses, and also to some private families, when the washing is done at home. The great advantages of a special stove are these:—Several irons can be heated at once, so that no time is wasted in waiting for them;

They are not liable to become blacked with smoke;

And the consumption of fuel is less than in an ordinary open fireplace.

Perhaps you have seen box-irons in which the body is large enough to contain a heater, but these are not commonly used, because they require a large fire to heat them perfectly, and this is not always convenient.

Trimmings of underclothing, and children's and ladies' dresses are frequently goffered, that is, set in little flutes with an instrument called a **goffering iron,** which is something like a pair of scissors in appearance.

This has been in some degree superseded of late by the introduction of a **crimping machine,** which makes the plaits very fine and close, thus giving a pretty, light appearance.

You all know the **Italian iron** too, which is sometimes used for setting very full flounces or frills.

When clothes have passed through these processes they still require thorough airing, and for this purpose a clothes-horse is a valuable agent. It is a highly criminal act to put out for use sheets, or shirts, unaired.

LESSON XXXVI.

WASHING PROCESSES.

DERIVATIONS.

Uncomfortable.—Not easy. **un**, not; *Lat.* **con-fŏvĕo**, to cherish very much.
Shrink.—To contract. *A.-S.* **scrinc-an**, to shrivel.
Action.—Something done. *Lat.* **actĭo**, a doing.
Fastened.—Made firm. *A.-S.* **fæstnian**, to fix.
Acquired.—Gained. *Lat.* **ac-quiro**, to get, acquire.
Expedients.—Quick methods. *Lat.* **ex-pĕdĭo**, to set free.
Effectual.—Certain. *Lat.* **ef-fĭcĭo**, to bring to pass.
Negligence.—Heedless omission of duty. *Lat.* **neglĭgo**, not to trouble oneself.

PRONUNCIATION. Exercise on sounds of *O* in

coal, dull, a bowl, should, mould, would, gold, bolt, nose, cross.

As has been said in the first lesson of this division of our subject, "washing day" is often made uncomfortable, because the ordinary routine of the household is upset while the cleansing processes are in operation. But with forethought and preparation there is not the slightest reason for this. Let us briefly consider the order of the processes.

First remember to collect and sort the linen the day before the washing day, so that you may have a fair start next morning without waste of time. Put stockings and socks, towels, coloured garments and flannels, into separate heaps; underclothing and bed linen by themselves. Soap into warm water any very dirty garments, and leave them to soak all night, so that the dirt may be loosened and come out easily in the wash. Also fill the copper with clean soft water.

Select a fine day if possible for washing, because clothes are so much sweeter and whiter dried in the open air. This is specially necessary when you have extra articles to wash, as counterpanes, blankets, and bed-hangings. These are too heavy to be dried in a room. The summer is the best time of year for them to be washed, because then they dry quickly and are of a good colour.

English washerwomen usually soften the water with soda or some patent washing powder, but in Holland and Belgium the women use borax instead; and it is said to answer exceedingly well; while at the same time it is perfectly harmless in its action, and does not produce a yellow tint as soda does.

Many of the washing powders contain lime in some form, and laundresses are frequently guilty of employing chloride of lime because it makes the clothes look white. This is dishonest and very destructive, for it rots the fabric and soon causes it to drop into holes. Besides, it is apt to take the colour as well as the dirt out of coloured fabrics.

On the morning of the wash rise early and light the copper fire, so that you may have a plentiful supply of hot water. Do not put soda into the water until you have washed your flannels and are ready to "make up the boil" with your white underclothing and house-linen.

Remember that soda spoils flannels by causing them to shrink and pucker. Rain water is best to use because it is soft, but do not make it too hot. If you are obliged to employ hard water, dissolve a little sal-ammoniac in it; because ammonia will cleanse without injuring the material. When you have washed the flannels through quickly, squeeze the water out of them, but be careful not to wring them too tightly or you will spoil them.

Have a pan of warm blue rinsing water ready. Pass them rapidly through this, squeezing the water out as before if you do not possess a wringing machine. Then peg them up immediately with the length of the flannel downwards. Some persons prefer to wash flannels in blue-water, and so not to rinse them after the lather.

You must not use soda for coloured things, because, though some fast-colours as they are called may not be injured by it, most others are at any rate liable to be. A little salt in the rinsing water is said to be an excellent thing for "setting" the colours of cotton or muslin dresses.

For body and house linen the water employed should be much hotter than that for flannels, and it may be used almost boiling if you have a machine.

After these clothes have been **firsted** or washed through once, they must be turned and **seconded** in clean hot soda water with soap. They should next be **boiled** in the copper for a short time, then taken out, **drained**, and **rinsed** in some cold blue-water. You must be careful not to allow white things to remain too long in this, or the colour settles in streaks, spoiling the clear appearance of the linen. When rinsed, carefully peg them out on lines to dry, making sure that each garment is fastened securely, so that there may be no danger of its tearing by the action of the wind.

Plenty of sunlight is an excellent thing for white materials, but coloured ones are best hung in a shady place. When the clothes are thoroughly **dried**, take them down from the lines and carry them into the house to be **folded.** All undergarments will be inside out; so now you must turn them and sprinkle each article lightly with water in order that they may be **mangled** or **ironed.**

Day shirts, fronts, collars, cuffs, skirts, and dresses, must be put on one side to be **starched** before they are folded. And if you pass your table linen through a little thin starch, it will look all the better when got up. Without slight stiffening the articles soon soil, and besides this they would have no bright gloss on the surface.

Starch may be used either hot or cold, according to the kind employed. Patent starch generally requires to be used while hot, or else it gives a greasy appearance to the surface of fabrics when they are ironed; but if you buy the best starch, it may be used cold with advantage.

Cuffs and similar articles which are required to be very stiff, are sometimes a second time dipped in raw starch, made by smoothly mixing it into a thin paste with cold water, or a teaspoonful of powdered borax is added to the boiled starch in mixing.

Of all processes in laundry work, starching especially requires the hands to be spotlessly clean, otherwise dirty marks are certain to appear on the clothes. After you have starched and wrung out the articles, roll them up tightly to keep them moist until you are ready to iron them out. This finishing or "getting up" process, as it is called, needs some skill, which is only to be acquired by much care and experience; so take pains to attain this if possible.

Unstarched underclothing is usually mangled first and smoothed out with a hot iron afterwards. House-linen too is generally mangled. But damask table-cloths, and dinner napkins, which have been lightly starched, require to have the stiffness set afterwards with a hot iron.

Inexperienced ironers generally find that starched articles cling to the iron; but there are several expedients to prevent this. Some persons dissolve a lump of white sugar in the starch; others say that it is a good plan to stir the hot starch with a tallow candle. But perhaps the most effectual method is to see that the irons are perfectly smooth and clean, with no remnants of hard starch clinging to the edges.

Airing is a final and essential process. Severe colds, which may terminate fatally, are sometimes caught through wearing damp garments, or sleeping in unaired sheets. Nearly every person we meet knows some sad story of lameness, consumption, or early death from some other disease, as the result of sleeping in damp sheets. Putting damp sheets on a bed, is little short of murder.

STAGE III.

1. RULES FOR HEALTH.
§ 2. THE MANAGEMENT OF THE SICK ROOM.
§ 3. COTTAGE INCOME AND EXPENDITURE.

§ 1. RULES FOR HEALTH.

[Teachers should study Dr. Parkes' 'Personal Care of Health,' S.P.C.K.]

LESSON XXXVII.

HEALTH: WHAT IT IS, AND HOW TO PRESERVE IT.

DERIVATIONS.

Doctor.—The popular name for a practitioner of medicine, a surgeon (chirurgeon, one who operates), literally, a **teacher.** Pure Latin.
Physician.—One who prescribes; one who has a College Diploma to practise medicine—literally, a naturalist. *Gr.* **phusikos,** natural.
Medcine or **Medicine.**—Physic. *Lat.* **mĕdĭcīna,** remedy, relief, antidote.
Violates.—Breaks. *Lat.* **violo,** to injure.
Contagious.—Communicating disease by contact. *Lat.* **con,** together; **tango,** to touch, to lay hands on.
Infectious.—Communicating taint through water or air. *Lat.* **in,** in; **facio,** produce, bring to pass.
Rheumatism.—A painful disease in joints and muscles. *Gr.* **rheuma,** a flowing.
Diarrhœa.—A disease of the bowels. From same root as above, and **dia,** through.
Fever.—A disease with a sensation of great heat. *Lat.* **ferveo,** to be boiling hot.
Gastric.—Belonging to the stomach. *Gr.* **gastēr.**
Diphtheria.—A sore throat depending on the formation of a membranous (probably a fungoid) deposit. *Gr.* **diphthera,** a membrane.
Scrofula.—Swelling of the glands, particularly behind the ears and under the chin.
Infraction.—Breaking down. *Lat.* **fractus,** a breaking.

PRONUNCIATION. Exercise on sounds of *O* in

open, to hop, to hope, shoe, to do, to, toe, tough, he swore, the floor, a moor.

THE word **health** is a fine old Saxon word, and contains in itself much meaning. Perfect health is that state of the body when there is no discord or disagreement in the system, but when all the functions work together to make a perfect **whole**; and hence whatever tends to the preservation of health is spoken of as **wholesome** or **healthful.** Life in a healthy body has been compared to sweet music. The state of health is well denoted by a term expressing unity. When we feel ourselves as we wish to be we say that we are well, or **whole.**

When unwell we require to be **healed**; and a doctor was once called a **healer.** The word Doctor properly means a learned man, one who teaches doctrine. A doctor of medicine is therefore a man learned in medicine. A **Doctor** of Medicine is one who holds a University degree of M.D. A **Physician** is one who is either a member or a Fellow of the College of Physicians. A Doctor is not necessarily a Physician, nor a Physician a Doctor. In savage countries the doctor is called medicine man—a very good name. There can be no doubt that health is one of the greatest, perhaps the very greatest, of all physical blessings. It is equally beyond doubt that if God's laws were obeyed, girls and boys, women and men, would be healthier than they usually are. At the present time it is quite well known that a large number of adults, and a still larger number of children, die of preventable diseases. Some speak of diseases and deaths as misfortunes, or as visitations of God, although in many cases they result from faults; and are only indeed visitations of God, in so far as they are the consequences due to the breaking of His laws. If any girl who reads these lessons be guilty of breaking any of the laws of health, as they are called, she will know therefore what she ought to expect. No one is ever let off who violates any of them. Many people shudder, rightly enough, when they read of the horrors of war; but many more are slain by pestilence and disease, which result for the most part from bad air, bad water, or bad odours, than by war. **Filth fevers,** such as arise from cesspools, bad drains, privies, overcrowding in bed and sitting rooms, heaps of decaying vegetable or animal matter, or pits of stagnant waters, cause more deaths than either war or famine.

Fevers are not the only diseases which arise from bad air and bad water. Ague, rheumatism, consumption, scrofula, diarrhœa, diphtheria, and many contagious as well as infectious diseases arise, **partly at any rate, from dirty habits.**

It is only of recent years that the attention of Government, and learned men, has been directed to sanitary matters. Local Boards of Health were established under the Public Health Act of 1848; and by the Local Government Act of 1858, any town or village may obtain the powers necessary for carrying out improvements required for the health of the inhabitants. Unfortunately, however, many towns and more villages wait, until a fever, or some other kind of epidemic rouses them from their fancied security, and compels them to remove causes of disease.

Personal health depends upon two distinct classes of causes, viz.:—

(1) Upon the place where we dwell. (2) Upon our own personal and family habits.

First, then, let us see what are the necessary sanitary conditions to make a house healthy. We mention six.

1. There must be good drainage, both of the land on which the house is built, and also of the house itself.

2. There should be free admission for light and air.

3. There should not be overcrowding, either in bedrooms or living rooms.

4. There should be plenty of pure water.

5. House refuse should be at once removed.

6. There ought to be no cesspool attached to the dwelling; but if there must be, then the drains connecting the house with it should be trapped, to prevent the return of the bad gases into the rooms.

These six rules apply more or less to all houses whether in town or country. As a rule, houses in towns are better looked after than those in the country. In a town, too, there is a medical man appointed as the **Health Officer** to give advice upon such matters; and also an **Inspector of Nuisances**, who may always be found by a letter addressed to the office of the Board of Works for the district. Any complaint made to him is sure to be attended to, and the cause remedied if possible.

1. **Drainage.** Good drainage is one of the first necessities of a healthy house. Typhus fever nearly always originates from the fact, that the air of a house is contaminated with the foul air that escapes from drains. Drain pipes are now made in such a way that it is very difficult for bad air to return, but have not yet been employed in all houses.

2. **Light, and pure air,** are necessities of good health, and you should remember this if ever you have to choose a house. Some methods for admitting pure air, and getting rid of impure air, have been given you in the lesson on Ventilation.

3. **Overcrowding** in lodging houses can be prevented, but overcrowding in private dwellings cannot. When there are too many inmates in any residence, nature asserts her laws by punishing their infraction, and kills

some of the younger, older, or weaker members of the family or families. But this is often a slow process. All who live in such rooms suffer more or less, because they are submitting themselves to a course of slow poison. To be kept in a proper state of health, every person requires 18 cubic feet of pure air every hour.

4. **The water supply** of a house is a very important matter, more important perhaps than the food, of which indeed, it forms no insignificant part. In the lesson on Water you have been told what to do to make sure that it is in a fit state for use.

5. **Refuse.** In the country, it is easy to have all refuse removed sufficiently far from the house to prevent its being harmful; and in town it can be taken away once or twice a week. That, which if allowed to collect close to a dwelling house, may breed fevers and other diseases; will, if dug into the garden, help to produce excellent crops.

6. **Cesspools** it is pleasant to know are gradually being done away with, as wiser systems of drainage prevail.

Secondly, it remains to say a few words on personal and family habits, in their relation to health. We give six.

1. **Cleanliness is the first necessity of good health.** It is the efficient application of the sanitary agents, air, water, and light; and it includes of course, besides personal cleanliness, clean underclothing, clean rooms with well-scrubbed floors and white-washed walls (which are far healthier and more seemly than dirty floors covered with scraps of old dusty carpet, and walls covered with bad paperhangings); clean windows, courts, passages, cellars, and closets, &c.

2. **Provident, careful, and thrifty ways** conduce very materially to the preservation of good

health, as they keep people away from numerous bad influences.

3. **Some knowledge of cookery,** and especially such as is suitable for the sick, and of nursing, helps also towards the same object.

4. **Habits of temperance.** It is said that three-fourths of the diseases treated in the hospitals of our large towns are the results of intemperance. All sorts of common ailments are aggravated, and many diseases of the vital organs, such as the liver, heart, lungs, and intestines, are caused solely by the use of strong drink. Then its effects extend even to the children of drinkers, not to their clothes and food only, but also directly to their bodies, leading to the formation of such diseases as rickets, consumption, and scrofula.

5. **Sound sleep** is another condition essential to good health. Shakspeare draws a striking picture of the wet sea-boy upon the high and giddy mast, sound asleep, as compared with the king on his sleepless couch. You will find it in his play of King Henry IV.

There is a proverb worth remembering on the matter. "Early to bed and early to rise, makes a man healthy, wealthy, and wise." Go to bed not later than 10, and get up at 5 or 6, when you are grown up. Children should be in bed by 8; and they should **never sleep with their heads under the bedclothes.** If they do illness is very likely to follow.

6. **Sleeping draughts should never be taken,** except of course when ordered by the doctor. A cold bath will often enable a person to sleep who otherwise cannot. Some use pillows stuffed with hops, but the best preparation for sleep is honest hard work, abundance of exercise and fresh air, wholesome food, and a good conscience.

Short but golden rules in regard to health may be given in the following brief form :—

a. Never sit in a thorough draught.
b. Never remain in wet clothes or wet boots.
c. Always wear flannel next the skin.
d. Never neglect a cold.
e. Never sleep in damp sheets.
f. Always say your prayers.

There are a number of small but valuable books on Health, published by the Ladies' Sanitary Association, 22 Berners Street, Oxford Street, London, that all would do well to read. The following are the names of some of them. They are called 'Household Tracts for the People,' cost 2*d.* each, and are worth their weight in gold :—

The Worth of Fresh Air.
The Use of Pure Water.
The Value of Good Food.
The Influence of Wholesome Drink.
The Advantages of Warm Clothing.
How do people hasten death?
The Secret of a Healthy Home.
The Two Breaths.
The Inspector, or How to get rid of Bad Smells without and Bad Tempers within, which costs only 1*d.*

And there are others, a list of which will be gladly sent to anyone who applies to the Secretary.

LESSON XXXVIII.

BATHING. WASHING. CHANGING CLOTHES.

DERIVATIONS.

Exaggerate.—Make too much of. *Lat.* **aggĕro**, to carry to.
Tepid.—Warmish. *Lat.* **tĕpĕo**, to be lukewarm.
Experience.—Knowledge resulting from practice. *Lat.* **expĕrĭor**, to put to test.
Perspiration.—Sweat. *Lat.* **perspīro**, to breathe everywhere.
Sweat.—Visible moisture which exudes from the skin. *Lat.* **sūdor**, moisture resulting from fatigue.
Necessity.—*Lat.* **nĕcessĭtas**, unavoidableness, inevitableness.
Constitutional.—Peculiar to one person's organization. *Lat.* **constitūtĭo**, disposition, nature; **constituo** is, to put together, to build.
Vitiated.—Spoiled. *Lat.* **vĭtĭo**, to make faulty, taint, or corrupt.
Tolerate.—To bear, put up with. *Lat.* **tŏlĕro**, to endure.
Retribution.—The unavoidable effect of our own actions. *Lat.* **retribuo**, to give back, return, pay.

PRONUNCIATION. Exercise on *OO*, &c., in

a stool, cool, tool, other, sooth, soon, spoon, noon, moon.

IT is impossible to exaggerate the importance of personal cleanliness. You doubtless remember the first lesson in Standard IV., and what cleanliness did for Mrs. Forsyth. If it be a question as to the best way of preserving good health, one of the answers is,—Be scrupulously clean. If it be a question as to the best way to recover health, supposing you are ill, one of the answers is,—Be scrupulously clean, in your person, in your dress, in your room.

Of course you all know why it is so important to be cleanly. You have read about the skin, and its millions of little pores, all working diligently to remove waste matter from the body. You know also that if you allow them to be clogged up by dirt, they will not be able to do their work so well. Then disease, which is the punishment of outraged nature, will come. Dirt is one of the chief causes of disease.

1. Firstly, let us speak of **washing.** Every girl ought to wash herself all over every day. It is not enough to wash the hands and face, and neck and ears; although it is of the last importance that they should be thoroughly cleansed. No dirt should be left on the wrists or neck, as a sort of high-water mark beyond which the water has not been; no dirt should be left in the interior crevices of the ears, or in the nails; or dust left among the hair. The head and feet should be well washed and rubbed thoroughly dry, at least once a week. It is absolutely necessary to wash the hips and armpits every day. This may be done before going to bed at night, or immediately after getting up in the morning. It is best to wash at night in warm water, because the weary body will be soothed; and in the morning in cold, as that will brace it for the day's work. It is not necessary to use much soap; but a little is better than none, especially with cold water. Let it be remembered that if warm water be used it should be only tepid, or about as warm as new milk. In drying the hands and face, and indeed all parts of the body, great care should be taken to rub them with the towel till all moisture is removed, and they become warm.

2. We will now say a few words about **bathing.** If every girl were to have a bath every day, there would be much less need for the doctor than there is. It is not necessary to have an expensive bath, but a good washing tub will do very well. "Tubbing" is one of

the names for taking a bath, and is applied to adults as well as to children.

A hip bath is more convenient for use, than a round open bath like a saucer. Those who can bear the water cold should do so; as it stimulates, strengthens, and braces up, the muscles and nerves. Feeling quite warm after a cold bath is the best sign that it is healthy. But all are not strong enough for the cold bath, and those who are not should of course have the water tepid; as indeed all should, whether strong or not, when they are not in good health. A good hip bath costs about 1*l*.

In most towns there are public baths for women and girls, as well as for men and boys. Those who have not the facilities for taking a bath at home, should try and go to the public baths at least once a week. The comfort they would experience, and the health they would preserve and strengthen, would more than repay the outlay of a few pence.

The London School Board is encouraging girls to learn to swim, and it is an excellent accomplishment. Perhaps you will smile when you are told that it is easy to swim. All those, however, who know anything about the subject say so; and if everybody could swim we should hear of fewer sad stories of persons being drowned. It is not difficult to swim because the whole body, except the brain, is absolutely lighter than water; so that in a proper position it will float. Some of you may have heard of the Englishman who swam from Calais to Dover, i.e. 21 miles. In the summer of 1877, a girl between twelve and fourteen years old swam several miles in the Thames. So it is to be hoped that as many of you as have opportunity will go to the baths, and if possible learn to swim.

3. Next in importance to washing and bathing, comes the frequent and regular **changing of body linen.** This is necessary even for those who never perspire sensibly, because insensible perspiration is constantly passing off from the surface of the body; the skin is always doing its best to perform its purifying work. Those who have severe bodily work to do, who have to earn their bread "in the sweat of their brow," and consequently perspire much, need to change their linen more frequently than other people. Flannel ought to be worn next the skin, but it should never be slept in, and should always be changed at least once a week. A warm bath, and a change of underclothing, are among the greatest bodily luxuries, to anyone fatigued by hard work.

We have hitherto spoken of the necessity of bathing, washing, and changing underclothing, as they affect the girl herself. But attention to these things is also necessary for the sake of her friends, and everyone she comes near. To some these cleanly practices are more needful than to others, for various constitutional reasons, but they are necessary for all. Those who do not practise them carry about with them a surrounding of more or less vitiated air, which accompanies them wherever they go; and it is not likely, either that they themselves will be very quick at detecting bad smells, or that others will tolerate such unclean persons if they can avoid it. It has been said that body linen should be changed not less than once a week. But in some cases it is necessary to change stockings and flannels every day. Each body has its own peculiarity, and it will be most healthy when allowed full freedom to act according to it.

LESSON XXXIX.

EXERCISE.

DERIVATIONS.

Zoological.—Pertaining to animals. *Gr.* **zoön**, an animal.
Essential.—That which must be. *Lat.* **essentĭa**, the being of a thing.
Sedentary.—Sitting. *Lat.* **sĕdĕo**, to sit.
Urgent.—Important, necessary. *Lat.* **urgeo**, to push, drive, force, impel.
Vulgar.—Rude, common, base. *Lat.* **vulgāris**, pertaining to the multitude. *Distinguish* the vulgar tongue, i. e. the mother tongue.
Recreation.—Amusement, pastime—literally, making over again. *Lat.* **recreo**, to restore, make anew.
Insidious.—Stealing on unseen and unobserved. *Lat.* **insĭdĭo**, to lie in wait.

PRONUNCIATION. Exercise on *O* and *OU* in

Monday, done, broom, bloom, enough, a bough, plough, look, took, book.

Exercise of some sort is necessary for everyone; and within reasonable limits the more young people have of it the better. The Latin verb **exerceo** means, to work hard, to train or drill, to employ oneself busily about anything. Those girls who have been to the Zoological Gardens in London or elsewhere, or have visited any collection of wild animals, have most probably seen the lion, tiger, fox, or jackal walking backwards and forwards as fast as possible in a small cage. The animal is taking exercise because its very nature dictates that such exercise is essential. Of course in a wild state it would take what was necessary in a very different way. But the point for your notice just now is, that what is needful it does take, in the best manner it can.

Exercise is quite as requisite for girls, as it is for lions and tigers; or, if that be not a proper comparison, we may say that exercise is quite as necessary for girls, as it is for boys. As a rule, the younger children are, the more exercise they ought to have. What girl ever saw a baby quite still, unless it were very ill or asleep? It is most probable if you were asked why it is necessary for a girl to take plenty of exercise, you would be able to give a sensible answer; at any rate you ought to be able to do so, if you have remembered what you read in the lessons on Respiration, Digestion, and Excretion.

You require exercise in fresh air, because it is there only, that the blood can become perfectly oxygenated, and the lungs do their work well. When a girl has a rosy, healthy face, we know at once that her lungs do their work well, and are not hindered in any way.

But exercise is also required that the intestinal digestion may be perfectly performed. The liver and the kidneys do not act properly if no exercise be taken; and consequently lazy, stay-indoors persons, frequently have diseases of those organs, which are quite unknown to active men and women. All the organs of our bodies, and especially the more delicate ones, become weak and diseased, unless they are used properly. Those persons who have a great deal of moving about to do in houses, do not need outdoor exercise so much as those who lead sedentary lives, such as dressmakers, and others similarly occupied. Unless those who earn their bread by sewing, and other such quiet occupations, get fresh air every day; their lives will neither be long nor comfortable ones.

Of course we may take either outdoor or indoor exercise. The following are some of the means by which we may have **outdoor exercise.** **Walking** is one way, but you should remember to walk briskly and not saunter about, or be for ever peering into shop windows. When you set out for a walk, you should make up your minds to go somewhere, and then off you should start, as if you were sent on a special and urgent errand. **Running** is better than walking, but cannot of course be carried on so long, and it is neither convenient, nor very proper in town streets. But if running be good, screaming, screeching, and coarse play are intolerably vulgar. **Drilling and marching** are very good forms of outdoor exercise, where they may be had. It would be an excellent plan if every girl could be well drilled by a drill sergeant once a week or even more frequently. Where this is not possible—and that, it is to be feared, is very nearly everywhere—drill must be done without. But in any case girls can hold themselves up well, and walk or run with all their might.

Many kinds of **outdoor games** are excellent. The girl that can play really well is generally a good girl both at lessons, and at home. Who remembers Nannie Jones in the story of Standard II.? It is sometimes thought that girls may not play at boys' games. Of course there are some boys' games that it would not be becoming for girls to play at. Cricket, however, is a healthy game for girls as well as boys. The more of their brothers' good games sisters can play at, the better for both.

In rainy weather we may be able to take only **indoor exercise.** This is the next best thing to recreation in the open air, but do not forget that it is inferior. The best indoor exercises are **skipping and dancing**. Every girl can dance, and should learn to do it well. If it be not possible to have music to dance to, you can dance without it, keeping time with your own hands, or by singing. In any case dance away with all your might. This of course means when it is play time, or when the work of the day is done; for in all things which are pleasant, the law for everyone is, **duty first, pleasure next.** But as a matter of course no good girl would dance, or wish to dance, at improper times, and in improper places.

Singing is excellent indoor exercise. Most girls can sing, and should try to do it as well as possible. Charles Kingsley once said, that the chief causes of the weak health of women and girls were silence, stillness, and stays. Therefore learn to sing and dance, and never wear tight stays.

There are plenty of **indoor games**, such as romps, acting charades, and so on. Making a noise is of itself healthy, when no one is inconvenienced or annoyed by it.

We need to say but a few words on the effects of taking no exercise, or what comes to very nearly the same thing, of not taking sufficient. One rule may be quite safely laid down, which is, that **everyone, if possible, should spend one hour in the open air daily.** This does not mean that one hour is enough, but that one hour is the least they ought to devote to outdoor exercise.

It has been well said, that a girl requires sport of some kind, as well as a boy; and that the present melancholy limitation of her pastimes is due to a mischievous and superstitious worship of spurious gentility.

To be delicate is considered by some ignorant people, as an enviable distinction; as a kind of proof that the delicate one at any rate was not born to earn her living; although the power to earn one's living is a noble distinction, and the earning it an honour.

Every girl should make her own bed, and tidy her own room; and these not only for the sake of helping her mother, which is her duty, but also for her own health's sake.

One of the first ill effects of want of proper exercise will be a white sickly-looking face, accompanied more or less frequently by a bad headache. These are the warnings which one's own nature gives, that it is not being treated properly. If you have a dog and never let him out, the poor fellow will bark and howl miserably. Listen to the difference between that bark and the one he gives when you let him loose. Well, if you chain up yourselves indoors always, your very selves will begin to complain. If you disregard these complaints, then indigestion will most probably follow; and in the train of that, bad health of various kinds, often accompanied step by step by insidious consumption, too often succeeded by an early death.

§ 2. THE MANAGEMENT OF THE SICK-ROOM.

LESSON XL.

HEALTH, AND HOW TO RECOVER IT.

DERIVATIONS.

Function.—The office or duty, as of any particular part of the body *Lat.* **functio**, a performing.
Permanent.—Remaining always. *Lat.* **permănĕo**, to continue, endure.
Impunity.—Free from ill effects. *Lat.* **im**, not; **punio**, to punish.
Parliament.—The House of Lords and the House of Commons. *Fr.* **parler**, to talk.
Inspector, *Lat.*—One who looks into or examines.
Hospital.—A place built for the reception of the sick. *Lat.* **hospĭtālis**, hospitable.
Capillaries.—Minute tubes resembling hairs. *Lat.* **capillus**, a hair.
Arterial.—Belonging to an artery. *Lat.* **artēria**, a windpipe.
Salubrious.—Healthy. *Lat.* **salūbris**, healthful.

PRONUNCIATION. Exercise on sounds of *A* in

bargain, carrot, barrel, part, chase, case, place, brace, face, mason, paste, taste, a can, chamber, age, rage, bacon, facts, radish, fade, able, apron.

WHEN every part of the body discharges its duty properly it is said to be healthy. Each organ performs its functions incessantly, quietly, and without our consciousness. If our attention be forcibly drawn to any action, it is almost certain to be by its derangement. It is out of order and needs care. It is out of harmony, and the consequent discord at once arrests our notice. Under these circumstances we are said to be sick, ill, or to have this or the other disease. If there be not much the matter we say we are unwell, or are indisposed. If but little be the matter however, even that little should have immediate attention; for as large rivers take their rise in very small streams, and large fires are kindled with one single match, so the worst diseases frequently result from slight colds which have been neglected.

Health is one of the most precious gifts of God to man, and therefore should be taken the greatest care of. There are probably very few who wilfully injure their health, but many thoughtlessly destroy it; and thoughtlessness is, after all, not very far from wilfulness. As a rule, those only who are in good health discharge their duties properly; or are comfortable or good-tempered themselves, and make others so. The only exception to this rule is that which relates to the case of permanent and incurable invalids.

It is the young especially who need to be often reminded that they ought to take care of their health. Young girls are too apt to think it does not matter; that they can disregard the laws of health with impunity, and that it is rather old-womanish to study them too closely. It is possible of course to be nervous and fidgety about health, but this is not what is meant.

Within the last half-century more attention has been paid to sanitary matters than in any former period of history; if we except the time when God, through Moses, gave sanitary laws to the Jews. Acts of Parliament have been passed to enforce drainage; to prevent crowding in lodging houses; and to compel the removal of nuisances. Local Boards of Health have been established, each of which has its sanitary inspector. In cases of infectious disease, efforts are at once made to remove all the sick to hospitals. Many books have been written on the subject. The young are taught about it in schools, so that we may look forward to a time when English men and women will enjoy much better health than they do at present.

As soon as any one of the organs of the frame is out of order, it immediately struggles, on its own behalf, to set itself right, and is assisted by all the rest. Generally, too, nature cures far better than the doctor, if she can be properly left to do her work.

Thus a cold produces obstruction in the capillaries which connect the venous with the arterial blood, and immediately the whole body is in a sort of feverish effort to clear away the obstruction.

Following up the hint given by nature, we take a warm bath, put the feet in hot water and mustard, take gruel, and then go to bed well covered with blankets, in order that we may perspire freely and so assist the capillaries to resume their natural healthy condition.

LESSON XLI.

DISINFECTANTS, AND HOW TO USE THEM.

DERIVATIONS.

* **Disinfectant.**—That which will destroy infection. *Lat.* **dis,** away from; **infectus,** tainted, spoiled.

Deleterious.—Injurious. *Lat.* **dēlĕo,** to destroy.

Antiseptic.—A remedy for putrefaction. *Lat.* **anti,** against; **septicus,** rotting, putrefying.

Volatile.—Flying away rapidly. *Lat.* **volatĭlis,** flying, fleeting.

Propagating.—Spreading. *Lat.* **propāgo,** to increase.

Scrupulous.—Very careful. *Lat.* **scrūpŭlōsus,** exact, precise, careful.

Accidental.—By chance. *Lat.* **accidens,** happening.

Precaution.—Forethought and foreaction. *Lat.* **pre,** before, and **cautus,** wary, heedful.

* **Efficacious.**—Producing a complete result. *Lat.* **efficio,** work out, bring to pass.

Ablutions.—Cleanings. *Lat.* **abluo,** to wash away.

* Facio (ficio), fēci, factum, is the root of both *efficacious* and *disinfectant.*

PRONUNCIATION. Exercise on sound of *AI* and *EA.*

a jay, a bay, a quay, May, delay, friar, mayor, pair, chair, chaise, waif, gain, train, distrain, faint, acquaint, eager, eagle, trade. treat, feeble.

Disinfectants, as the name implies, are substances which will destroy infection; i. e. that will take away the danger of propagating or communicating disease. Diseases communicable through air or water are described as infectious; while those that can be given to other persons only by contact are called contagious.

There are many kinds of disinfectants more or less valuable. Every girl should be familiar with the best, know where to obtain them, what they cost, and which are the most suitable to use in any given circumstance. The following are the most important:—Condy's fluid, antiseptic vinegar, and antiseptic powder; Burnett's fluid; chloride of lime; and carbolic acid, all of which can be obtained of any chemist or druggist. Of these the best disinfectants are:—1. Condy's fluid. 2. Chloride of lime. 3. Carbolic acid.

1. **Condy's fluid.** This disinfectant is under most circumstances efficacious, and in all unobjectionable. Its active principle is oxygen, which as you know has no odour, and is the agent of natural disinfection, so far as the air is concerned. The fluid is neither offensive nor deleterious, and may be prescribed for internal use by medical men. There are two kinds, the red and the green, of which the latter is cheaper but not so pure, and is most useful for drains and for large operations; while the former is best for domestic use. Both can be purchased in bottles containing from half a pint to a gallon. Before being used the fluid should be diluted with 200 or 300 times its volume of water. If you remember that 200 teaspoonfuls are about a pint, and 200 wineglassfuls about a gallon, you will know that a pint of water should be mixed with one teaspoonful of the fluid, and a gallon with a wineglassful. In other words, if you wish to have a pint of disinfecting fluid ready for use, put a teaspoonful of the red, into a pint of water; and if you want a gallon, put in a wineglassful. This gallon will cost about a halfpenny.

2. **Chloride of lime.** This requires care and experience in its management, and is not suitable for sick-rooms, as it has a disagreeable odour. If used too freely in inhabited houses, where the inmates are in

good health, it may give rise to irritation in the bronchial tubes of the lungs. When the air is very heavily loaded with the fumes arising from chloride of lime it is difficult to breathe at all. This compound of lime is solid and costs about 2*d.* or 3*d.* a pound.

3. **Carbolic acid.** This is extremely poisonous, as is also Sir William Burnett's fluid. On this account therefore great care must be taken in using these disinfectants, as accidental deaths have been caused by the mistaken use of them. Carbolic acid is nevertheless very extensively used, and is preferred to any other by some experienced men. It emits, however, an odour which is offensive, and for this reason it is not well adapted for use in rooms inhabited by weak, sickly, or invalid persons, or such as are convalescent and cannot bear rough treatment, or unusual odours. Carbolic acid should be mixed with from twenty to forty times its bulk of water. But it can also be obtained in two forms of powder; and specially prepared tin cases are sold for placing it in small quantities where it may be required.

A little spirit of salt put into any liquid disinfectant makes it act more quickly.

The following ten hints comprise nearly every case that requires attention, and those who will remember and act upon them, will never stand in much danger from infection. The great thing is to know what to do at the right time, and to do it:—

1. Drinking-water.—See that cisterns and water-butts are clean. Test the contents to discover whether there be any pollution or organic taint. This is very easy. All that is necessary is to add to a tumblerful one or two drops of Condy's (crimson) fluid, which will give it a very faint pink hue. If, after standing half an hour, the pink colour have gone or turned to yellowish, the water is tainted and cannot be used safely in the state in which it is. If, on

the contrary, the pink hue remain, the water may be used with safety. But in every case filtration is a very desirable precaution. That operation will be rendered still more efficacious against organic pollution by adding to the water to be filtered enough of Condy's fluid to give it a pink colour; and when no filter is within reach, the latter measure alone may advantageously take its place.

2. Drains.—If possible flush once a day with abundance of water containing some disinfectant.

3. Sinks.—Scrub and cleanse with water impregnated with a disinfecting agent, as strong soda.

4. Closets.—See that traps are in good order.

5. Dust-bins.—Sprinkle the contents once a week, and oftener in summer, with diluted disinfecting fluid, by means of a watering-pot having a perforated rose, and have them regularly emptied.

6. House Ventilation.—Keep rooms and passages sweet by opening windows and doors for the admission of air. Fires with open windows greatly promote ventilation.

7. The Sick-room.—In infectious cases remove bed curtains, window hangings, and carpets. Use ventilation cautiously. Employ some disinfectant, sprinkling it from time to time on the floor. Place a dish or soup plate containing disinfecting solution underneath the bed occupied by the sick.

Have close at hand a tub or pail of diluted disinfecting fluid, into which immediately to throw any article of clothing removed from the patient.

Instead of a pocket handkerchief, let small pieces of rag be used, which are to be burnt after use.

In cases of severe fever or small-pox hang outside the door of the room, from jamb to jamb, a sheet or old counterpane, and keep it moistened with disinfecting solution.

8. Infected Clothing and Bedding.—Linen and such woollen articles as admit of washing, should, on being removed from the patient, be plunged for an hour or two into a tub of water impregnated with Condy's fluid; after this they can be boiled and washed with impunity. Clothes, mattresses, beds, pillows, &c., in the absence of proper public disinfecting ovens, are to be disinfected by exposure in the open air, to the sun, if possible, or in front of a large fire.

9. Nurses and Attendants.—Woollen dresses are to be avoided, and the preference given to washing materials. Prevent contact, as much as possible, between attendants and the inmates of the house. After handling the sick or things connected with them, let the nurse be careful immediately to wash her hands in water impregnated with some disinfectant.

10. The Patient.—In cases of fever, as soon as may be admissible anoint the surface of the body, the scalp or skin of the head included, twice a day with camphorated oil. The earliest appearance of scaling off of the scarf-skin will furnish the indication of the period beyond which this measure must not be delayed. When the patient has gathered sufficient strength, let him take a warm bath, to which a wineglass of Condy's fluid has been added, and afterwards be well washed with soap and water. During a week or ten days from this time he may be kept apart, repeating daily the disinfecting ablutions; after which time he may with safety mix again with his family.

It is to be remembered, that those who do not take all reasonable and proper measures to prevent the spread of infectious diseases, can be punished by the law; but if they escape such punishment, they are still guilty of gross selfishness and wickedness.

LESSON XLII.

THE SICK-NURSE. HOW TO HELP THE DOCTOR.

DERIVATIONS.

Sympathy, *Gr.*—Feeling with.
Experience.—Trial, proof. *Lat.* **expĕrĭor**, to try.
Punctually.—At the very minute. *Lat.* **punctus**, a point.
Embrocations, *Fr.*—External liquid medical applications, a lotion, wash.
Invalid.—*n.*, a sick person; *adj.*, weak, unsound. *Lat.* **invalidus**, infirm, weak, feeble.
Patient.—*n.*, one who suffers; *adj.*, longsuffering, not soon angry. *Lat.* **patior**, to bear, suffer.
Noxious.—Hurtful. *Lat.* **noxius.**
Engenders, *Fr.*—Causes, originates.
Injudicious.—Unwise. *Lat.* **in**, not; **jūdĭco**, to examine carefully.
Accumulated.—Heaped up. *Lat.* **ad**, to; **cumulus**, a heap.
Opportunity.—Fitting or proper time. *Lat.* **opportunitas.**
Fomentations, *Fr.*—Partial bathing with warm lotion.
Convalescence.—The recovery of health. *Lat.* **convalesco**, to regain health, to get better, to grow strong.

PRONUNCIATION. Exercise on sounds of *A* and *AU.*

because, chafe, safe, beauty, fault.

And of *E.*

agree, tea, cheese, clergy, certain, celery, veal, cease, niece, reason, season, feast, beast, leash, deceive, receive.

FEW if any women pass through life without being called upon to nurse a relation or a friend. It is proposed, therefore, to give a few useful hints for the benefit of those who may need them.

Love and sympathy may do much to solace the weary hours of a sick-room, but without good rules and experience, many nurses are rather a hindrance than a help. When a doctor is called in, it is the nurse's first duty to follow out his instructions carefully, giving both medicine and food at the times he directs.

Many medicines are poisonous if given in too large quantities, and too small a dose may do no good; consequently the greatest care is required to measure the exact quantity. A careless, slovenly way of pouring out medicine, shows an indifference which is quite at variance with the duties of a nurse.

One cannot speak too strongly on the danger of giving wrong medicines. Many people have lost health, and even life, through the carelessness of ignorant nurses. If the chemist or the doctor omit to follow the general rule of putting embrocations or lotions into dark bottles, the nurse should tie a ribbon, or something distinctive, round each bottle of mixture intended for external use only. She should be very careful to do this, for external applications are almost invariably poisonous. No one should ever keep old medicines, as they are seldom wanted again, and soon spoil.

A nurse ought on no account to wake a patient, in order to give either food or medicine, unless specially told to do so by the doctor. But she should have everything quite ready that it may be given directly the patient wakes.

The sick-room should be kept warm, but well ventilated. A cold room is not necessarily fresh, nor need a warm room be stuffy. The window should be kept a little way open at the top all day, and even at night, unless the weather be very cold. If a cloth or a blind be placed over the opening, the cold air will be kept from the patient; while it will purify the general air of the room. When the window cannot be opened at the top, you may then throw a light shawl over the face of the invalid, while the sash is thrown well up. This will both ventilate the room and refresh the sick person.

Remember that **you ought never to keep anything whatever under a bed.** This hint applies to persons in health as well as to the sick. Nothing impure should be left in the room one moment longer than is necessary, and if a good supply of water and Condy's fluid be kept always ready for use, it may prevent much mischief in the sick-room.

The remains of food, tea, &c., should be removed as speedily as possible. Indeed, nothing but what is absolutely needed, should remain in the room. So do not fail to take away at once dirty wearing apparel, dying flowers, and anything that harbours dust or engenders smell. Freshly cut flowers are refreshing for both mind and body. The water should, however, be changed every day, in order that they may be kept fresh.

After what has been said about keeping the air of the room pure, we need scarcely warn the nurse against allowing strangers or visitors to eat in the sick-room; indeed, no visitors should be admitted, except those whom the patient really desires to see.

The health and looks of the invalid should, as a rule, never be made the subject of conversation. A few injudicious words may sink deeply into the mind of a sick person, who has little to distract the thoughts. Cheerfulness is a great charm in a nurse, and she should be very careful not to *amuse* the patient by relating sad occurrences, or accounts of persons she has known who have died in the same kind of illness; or anything else likely to disturb the mind, or awaken painful thoughts. A nurse should talk quietly, but not whisper, as that is very annoying to a person who is weak. The necessary noises of poking the fire, and putting on coal, often worry an invalid. The first may be much lessened by using a piece of wood instead of a poker, and coal may be put on a piece at a time with the hands, a housemaid's glove being kept for the purpose if necessary.

To avoid the accumulation of dust, the nurse should take the opportunity, when the patient is feeling at the best, to wipe round the room and under the bed with a damp, not wet, cloth. This prevents the dust from flying about the room, which often makes the patient cough. The nurse should be careful never to jog or shake the bed.

Do not forget that sick people require washing as much as the healthy; not the face and hands only, but the whole body. The invalid, unless very ill, may, with the nurse's help, do something in this matter. The night-dress must be drawn well out of the way to prevent it from getting damp; and the bed-clothes held away from the body. The patient may thus wash every day with either a sponge or flannel well wrung out in warm water. The nurse should have a dry, warm towel ready. The feet can be washed one at a time. The refreshing effect of this washing is invaluable to the invalid, and besides, it often promotes sleep when nothing else will.

When the patient is well enough to have the bed made, the nurse should wrap him up well and place him in a chair away from any draught. She should then remove all the bed-clothes into another room, and after shaking them at an open door or window, hang them before the fire till she is quite ready to replace them. The mattress must be turned over, from top to bottom one day, from side to side another. This makes a great change, and the invalid enjoys the fresh, smooth bed. A clean sheet should always be put on warm, or the patient will feel a chill. A piece of waterproof sheeting, about a yard square, is a valuable addition to the furniture of the sick-room.

The nurse should be careful not to make at one time too large a quantity of beef-tea, bread and milk, &c. We sometimes see a cup of boiling food given to an invalid, who is then kept waiting while it cools. A smaller quantity hot, mixed with some cold, kept at hand for the purpose, saves the patient much fatigue and disappointment.

If solid food be allowed, it should be thoroughly cooked. A sick person cannot digest badly prepared food. It is also important to make it look tempting, as well as agreeable to the taste. Sick persons cannot help being fanciful, and the humouring of harmless fancies will often promote convalescence.

And now one last word of advice.

If a patient should be so unwise as to ask for beer, or wine, or spirits, unknown to the doctor, the nurse must remember that his life is in her hands, and that she must absolutely refuse to give it. If she give either, by a fancied act of kindness, she may be doing the very worst possible thing for her patient; and instead of helping the doctor, may help to kill the patient.

LESSON XLIII.

HOW TO TREAT SMALL AILMENTS AS THEY ARISE.

DERIVATIONS.

Debility.—Weakness. *Lat.* **dēbĭlĭtas**, weakness.
Extracted.—Drawn out. *Lat.* **ex**; **traho**, to draw.
Consistency.—The state or form of the substance of a body. *Lat.* **con**, together; **sisto**, to cause to stand.
Fomentation.—Warm application. *Lat.* **fōmentum.**
Chilblain.—Sore caused by cold.
Experience.—Trial, proof. *Lat.* **expĕrĭor**, to prove.
Effectively.—Thoroughly. *Lat.* **facio**, to make.
Aperient.—Opening. *Lat.* **ăpĕrĭo**, to open.

PRONUNCIATION. Exercise on vowels and final consonants in

joist, a mine, to dine, fine, viper, poor, close, fool, corner, stuff, gown, onion, rogue, coach, brooch, cock, coat, shop.

MANY so-called small ailments may become very severe illnesses if neglected, and thus much inconvenience, trouble, and even danger be incurred. **Headache,** for instance, very trying in itself, is not unfrequently a precursor of what is called a cold, and almost invariably precedes fevers and other complaints. If therefore you have a severe headache, which you cannot get rid of by a good wash and brush, or a good walk in fresh air, or by going without your dinner, you have perhaps taken cold. The best cure then is to go to bed early, put the feet in hot mustard and water, and be well wrapped up in extra blankets, so that you may get into a good perspiration. This will enable the blood, by its more rapid circulation, to remove the obstacles to its movement caused by the chill. It is well also to take a teaspoonful of sweet nitre, or half a teaspoonful of powdered nitre in hot water, just before you get into bed. This is an excellent though homely medicine. It will cause the skin to act freely, and will thus aid in removing the headache and fever that generally accompany a cold. No one who has been treated thus for a cold should attempt to get up before the perspiration has quite passed off. For a nervous headache, nothing but sleep and quiet will do any good.

The remedy for **toothache** depends partly on the cause. Sometimes half a teaspoonful of carbonate of soda taken in a tumbler of water will cure it. But if it proceed from general debility, two grains of sulphate of quinine should be taken two or three times a day. Many of the advertised remedies are mere quackery. The teeth should be well brushed in the morning, and at night before going to bed, and if possible, too, before and after dinner. The stomach exercises great influence on the teeth. In some cases, where decayed teeth cannot be stopped by the dentist, there is no remedy so perfect as having the aching tooth extracted. One sharp pain and it is all over.

Many people suffer from **boils.** They may arise from breathing bad air, or from weak health. In the first case the ventilation and drains must have attention; in the next, tonics and good food must be taken. Half a teaspoonful of brewer's yeast, taken before breakfast, is considered by some a sovereign remedy. The boils should be bathed frequently with very hot water, and be kept covered with linseed-meal poultices, which will allay the pain and prevent the skin from being irritated. Irritation may cause other boils to appear, and is therefore to be carefully avoided. Before applying the poultice, it is well to rub the skin with a little cold cream to prevent the meal from sticking.

The following is the best way of making a **linseed poultice.** Scald a basin and dry it well. Then put into it as much linseed meal as may be required for the poultice. Next pour over it boiling water, stirring it well as you do so, with the blade of a dinner knife. When you have mixed it to the consistency of thick batter, leave it a few moments to swell, and then spread it thickly on a double piece of calico. For boils the linseed must be applied next the skin; but in other cases it may often be advantageously covered with a piece of very thin muslin, carefully turned in at the edges.

Of course, the poultice will be nearly useless unless put on very hot, so you must be quick, and know what you are about, and how to manage deftly, for the meal very quickly cools. If the poultice can be covered outside with a piece of waterproof of any kind, it is a good plan. To keep in the heat and moisture, cover the whole carefully with a piece of flannel, or a silk handkerchief. The poultice should be firm enough to come off without breaking.

When a linseed-meal poultice is required for a sore throat, or for a cold in the chest, you should sprinkle a little mustard over the surface, as this increases its efficacy. You must remember, however, that it must be taken off sooner, or it may blister the skin. Remember also that when you have to apply **fomentation,** you must take two pieces of flannel and fold them several times until they are of the required size. This done, place them on an open towel in a large basin, and pour enough boiling water to cover them. Then roll the towel over, and hold the ends, while the flannels are wrung out very dry. Now apply the flannel to the patient. It should be covered with a piece of waterproof, or something thick, to keep in the heat and moisture. Over the whole tie securely, or strap, a hot dry flannel. Remember also to keep the water boiling for pouring over another flannel when the first begins to cool. You will not need much water each time. But you will need that it be very hot. It is of the greatest importance that the flannels be wrung as dry as possible.

A **chilblain** is a small ailment, but it often causes great pain, as probably some of you have experienced in winter time. Chilblains generally proceed from bad or weak circulation, and may be caused by wearing tight boots. You cannot do better than rub them night and morning with a little olive oil, and wear a loose shoe or boot. Chilblains on the hands are often caused by not drying them thoroughly after washing. In winter time especially, when the hands are washed they should be rubbed until they are quite warm and dry; as should any other part of the body, but more especially behind the ears, for if that be not done very painful ear-ache may result.

Blisters on the feet are best cured by rest. Some recommend that they should be pricked, but on the whole experience is against this remedy. A little soap and whisky rubbed into the skin hardens it. Knitted, well-fitting woollen socks, are the best preservatives against blisters.

Corns are almost always caused by wearing tight boots, especially those with high heels. They can be cured, only by entirely removing the pressure. They may be relieved by various means; such as, continual and careful cutting, or placing over them a plaster of wet rag soaked in vinegar. The advertised cures are for the most part shams. Prevention is better than cure in corns as in other things.

A **cut finger** is a common injury. Be careful how you use a knife, especially when you cut bread. A cut should be bound up at once, with a strip of clean linen, and left until it is healed. A glove finger may be worn over the linen if possible, for the sake of tidiness. A severe cut must have the sides carefully pressed together, the skin being then carefully washed clean. The wound ought to be covered by crossed strips of diachylum plaster warmed to make them adhere easily.

When a nail has a tendency to crack, this may be cured by rubbing it with a little glycerine.

The best dressing for a **bruise** of any sort, is a piece of clean linen, dipped in cold water, and constantly changed as soon as it becomes dry.

A **burn or scald** should be covered as soon as possible with cotton wool, and left for a week or more untouched. It is cured most painlessly and effectively by keeping the air away from the skin.

Ear-ache is one of the most painful of early maladies. It may be eased by dropping a little warm sweet oil into the ear. It may perhaps be prevented by special care being always taken to dry the skin thoroughly behind the ears, after washing.

If an insect get into the ear, the safest and best expedient for getting it out, is to drop sweet oil in, which will bring it out whole.

One of the acutest of small pains is caused by the presence of a small fly, or sharp grains of dust in the eye, as little Prince Arthur reminds Hubert in Shakspere's 'King John.' These may be removed sometimes by holding the lid well up, and blowing the nose hard. If this fail you must let some one look into the eye, and remove the foreign substance with the corner of a pocket-handkerchief.

Everyone ought to know simple remedies for so common a complaint as **diarrhœa**. If it arise from eating too much ripe fruit, a chalk mixture may cure it. If it be accompanied by a bad, furred tongue, a dose of aperient medicine should be at once taken. Good, plain rice food is the best in such circumstances. A teaspoonful of powdered cinnamon in a little brandy and water is a safe and harmless remedy.

It may be worth while to say a very few words here on the simplest domestic medicines :—

1. **Castor oil.** Give a child a teaspoonful, an adult two or more.

2. **Epsom salts.** Give a child a teaspoonful, an adult two or more. It is best given in senna tea, or syrup of senna.

3. **Rhubarb.** Give a quarter of a teaspoonful to a child, and half to an adult.

Most medicines are more wholesome and more efficacious when taken with as much water as possible.

The following is one of the 'Wayside Thoughts' of Mr. D'Arcy Thompson :—

"Cold, and hunger, open the doors of the body to disease ; and melancholy is too often the forerunner of wickedness."

§ 3. COTTAGE INCOME, EXPENDITURE, AND SAVINGS.

Teachers will find valuable information on these subjects in Archbishop Whately's 'Easy Lessons on Money Matters'; Pott's Arithmetic. Section II., "Money," 6d., National Society's Depository; Bartley's 'Provident Knowledge Society's Papers,' 1s.

LESSON XLIV.

MONEY: ITS USE AND ABUSE.

DERIVATIONS.

Medium.—A means. *Pure Lat.* **mĕdium.**

Exchange.—Giving one thing for another. *Fr.* échanger.

Barter, *Fr.*—Traffic by changing goods. To *barter* is to give one thing in *exchange* for another.

Standard.—A settled rate, rule, unit, &c., as a test of other things.

Value.—The worth of a thing in exchange. *Lat.* **vălĕo,** to be worth, to be strong.

Patriarchs.—Fathers, or ancestors (specially of the Jews). *Lat.* **păter,** father.

Sterling.—English coin. Probably from the **Easterlings,** who were employed as coiners. (The Easterlings, or Germans, are said to have had their money of the purest gold.)

Respectable.—Good-mannered, trustworthy. *Lat.* **respecto,** to care for, regard.

Rational.—Wise, marked by good sense. *Lat.* **rătio,** the act of thinking.

PRONUNCIATION. Exercise on sounds of *U* and *AN.*

ague, gruel, mews, sure, just, flute, fruit, suit;
chance, dance, danger, stranger, change, ancient, branch, plank,
trench, chandler, dandelion, aunt.

Part I.

Money is the medium of exchange, and the measure of value in all civilized countries. It is the **medium of exchange,** i.e. the means by which people obtain the various things they want. Thus a shoemaker sells a pair of boots, or a draper a dress, and each receives money. The money of itself, as so many coins, is of no value, except in exchange. But the shoemaker or draper can take the money and buy with it what he wants, food for example, or articles of clothing. The money therefore is a sort of go-between. But money is also **the standard of value,** i. e. the value of all things, or more properly the **price** of them, is estimated in money. **Price** is money value.

It would be possible to express the values of all articles in other things than money, in corn or cattle for example, but it would be very inconvenient. Yet although inconvenient it was once done. The Latin word **pĕcūnĭa,** from which our word pecuniary is derived, means property, riches, wealth. The chief wealth of the early inhabitants of Italy, as indeed of those of almost every country, Australia for example, was flocks and herds. You will no doubt remember that the riches of the Patriarchs is always spoken of as consisting of "flocks and herds." The Latin word **pĕcus** means a single head of cattle, one beast, or one sheep. Land or houses were said to be worth so many beasts, or so many sheep. Think how awkward it would be to drive oxen or sheep about the country, to pay for anything we wanted to buy. The Romans used to do so at first, but they soon found out a more convenient way. They took a piece of copper, or sometimes a piece of stout leather, and stamped on it the figure of the sheep, or an ox; and called it Pecus, or Pecunia. With this they could buy corn, or oil, or wine, or whatever they wanted; because those who received the stamped leather or copper, could exchange it again for anything they needed up to the value which it represented. Thus, if they wanted a real ox, or a real sheep, they could get one. Coins are stamped much in the same way, and if everyone agreed to receive stamped bits of tin, or tickets, these would do almost as well as money.

The earliest method of exchanging one sort of goods or commodities for another, was called **barter.** It is the way in which a good deal of trade is done now, with barbarous countries. And it is really the way in which the vast commerce or trade of the world is carried on. One country buys goods or raw produce of another, and pays for them with its own goods or produce; paying or receiving only the difference in money; but even this difference is frequently adjusted in goods from some other country. Thus England obtains raw materials such as tea, coffee, and sugar, cotton and wool, cattle and corn, from different countries; and pays for them with coal, iron, manufactured goods, or colonial produce.

Money may be either coins or paper money. **Bank notes are paper money.** Anyone who has a *5l.* Bank of England note, can obtain five sovereigns for it, although the paper itself is worthless. The Bank of England keeps the sovereigns, and gives out these notes or tickets, which pass about from one person to another, until some one takes them to the bank and asks for the real money, which he is sure to get. Thus the paper is as good as money, better in some respects indeed, for it is easier to carry and it costs less. If people were not sure of getting the sovereigns, however, they would not be so willing to take the bank note.

Coined money consists of money made from gold, silver, or bronze. It is important to have what are called precious metals for coins, for these reasons. First, they represent great value in a small bulk. Think what a trouble and burden it would be to carry money about made of iron or wood. Secondly, they can be easily divided into small pieces. Thirdly, they stand wear and tear well. Fourthly, they have or represent a value in themselves even though they be melted down. Thus if you could melt half-a-crown into a rough and shapeless bit of silver, it would still be worth very nearly thirty pence.

You know the names of the coins that are in use now, or are **current** as it is said. They mostly have the Queen's head on one side and the royal arms on the other. But they vary in both respects a good deal. They are all worth looking at, and you should try to understand what is upon them. If you do not understand, ask your teacher to tell you. There is a good little book about **money** sold for 2*d.* by the publisher of this reading book.

In England, the sovereign, or **pound sterling,** which is as you know a gold coin, is the **standard of value.** Things are said to be worth so many pounds. A thing is worth a pound, or a shilling, because it took about the same amount of similar labour and time to obtain the amount of gold of which a sovereign is made, or the amount of silver of which a shilling is made, as it took to make or obtain what is said to be worth a pound or a shilling. Silver is twenty times as abundant as gold, so twenty shillings are of the same value as a sovereign. Three shillings, or a florin and a shilling, are about as heavy as two sovereigns. Once a sovereign was worth a **pound** troy of silver. Copper or bronze is more than 240 times as abundant as gold, so 240 pennies are of the same value as a sovereign.

Perhaps the following accurate statements may be of use to you.

1. Gold is worth 3*l.* 17*s.* 10½*d.* an ounce troy. Its price is determined by law and **remains always the same.** The price of all other things is continually changing.

2. The sovereign was first coined in 1817; and it is so called because it bears the head of the sovereign.

3. A sovereign weighs 123·274 grains troy;—123¼ may easily be remembered.

4. Standard gold is 22 parts pure and 2 parts alloy of either copper or silver. This is required to make the metal harder. If you look at several sovereigns, you will see some are whiter than others. These are alloyed with silver, as the Australian ones mostly are.

5. Standard silver is 37 parts pure silver and 3 alloy.

6. Rather more shillings are coined out of a pound of silver than it is actually worth as compared with gold at 3*l.* 17*s.* 10½*d.* an ounce troy, so silver money is not a legal tender above forty shillings. If you owe anyone more than forty shillings or two pounds, he could not be **compelled** to take silver for the whole debt, though he most likely would not object to do so.

7. Bronze metal of the present coinage, which was introduced in 1860, consists of 95 parts of copper, 4 tin, and 1 zinc. A penny weighs ⅓ of an ounce avoirdupois. Two halfpennies are slightly heavier than a penny.

Part II.

The use of money is to buy what we want. The abuse of it is to spend it recklessly, or carelessly, for what we do not want. Two rules about spending and saving should never be broken. One is, never buy anything you do not really want because it is said to be cheap, or a good bargain. Cheap goods as a rule are bad. This does not apply to the case when some productions are more plentiful, and therefore cheaper, than when they are scarce. Another rule is, never buy anything that you cannot pay for. It is disgraceful to be in debt.

Persons who are in debt are often guilty of the meanest and shabbiest conduct; and it is notorious but very true, that as soon as people are at all accustomed to be in debt, they cease to be careful, and become extravagant even in small things. They use expensive paper to write on, for example, and scorn post-cards. Another great point to keep in mind is, that it is the duty of everyone, no matter how little she earns, to save some of it. Then you must remember that it is a noble and right thing to be able to earn your own living. There is plenty of work for all honest women and girls. Some think it is very hard to earn money. So it is. But it is much harder to spend it well. Perhaps one of the most difficult lessons to teach those who earn wages is, how to spend them.

Maidservants who are honest, hard-working, and respectable, can always command good places and good wages. Their food and lodging are found. And those who have to work hardest, have never to work so hard as a married woman who has to keep house, cook, wash, and attend to her husband and two or three children or perhaps more. Some women also can work in shops, or printing works, or at watchmaking, at sewing, in telegraph offices, and so on. But it may fairly be doubted whether any woman's work, take it all in all, is better than domestic service.

For your work, whatever you do, you will expect quite rightly pay, wages, salary. There is one reward of good honest work quite irrespective of pay, which is the consciousness of having done anything well. The feeling of pride over good work nobly done, is a justifiable pride. You must always strive to be proud in this way.

"Limiting the idea now to **pay**, the question is not so much what quantity of coin you get, as—what you can get for it when you have it. Whether a shilling a day be good pay or not, depends wholly on what a 'shilling's worth' is; that is to say, what quantity of the things you want may be had for a shilling. And that again depends, and a great deal more than that depends, on what you **really do want**;"[1] not on what you think you want; nor on what other people have; nor even on what other people say you want.

If you want only drink, and cheap, fine clothes, such and such pay may be enough for you.

If you want good meat, and good clothes that will wear well, and look respectable for your station; then you must have a higher wage.

If you want clean rooms, and fresh air, and purwater, as well as good meat, and good clothes, then more wage still, and so on.

Strange to say, however, very few people have a really proper taste for cleanliness and fresh air. Some prefer a dirty carpet to a well-scrubbed floor. You at any rate must know better than that.

But you ought also to require some rational enjoyment. You should want occasionally to be amused, merely for the pleasure of it. And this is one of the most difficult wants you have to supply. If you can read a good story or poetry book, that is rational amusement; provided you do not read it when you ought to be doing something else. If you can sing, or dance with your friends, that is rational amusement. If you can get a day in the country, and a look at sweet flowers, and green trees, and clear rippling streams, and bright skies—if you can see lambs, or cows, or horses feed in fields—and feel pleasure at seeing these good gifts of God, that is rational enjoyment. Or if you can go to the sea-side, or to a town and see a cathedral or a picture-gallery or a museum, that also is reasonable gratification.

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[1] Professor Ruskin.

But it is not rational enjoyment, or indeed should not be enjoyment at all, to go a long journey by a cheap train on a railway dressed out in vulgar finery. It is not rational enjoyment to undergo as much fatigue on a holiday as on three or four working days; to come home jaded, pass a sleepless night, and get up with a headache. It cannot be rational enjoyment ever to go where you would not like to have your truest and best friend with you; or where you could not tell your mother all you had seen when you returned.

NOTE.—"It is the opinion of writers [who have studied these subjects] that the French people with far less wages, are happier than the operatives of Great Britain who receive the highest wages in Europe, on account of the steadiness and economical habits of the former; and the strikes, drinking habits, and recklessness of the latter. More misery results from strikes in England, and from Socialism and Communism in Germany, than from all other causes combined, hard times included."—TIMES, *August* 21, 1879.

LESSON XLV.

PAYMENTS AND ACCOUNTS.

DERIVATIONS.

Excellent.—Best, hence a title of honour. *Lat.* **excellentia**, superiority.

Honest.—Upright, pure. *Lat.* **hŏnestus**, respectable.

Prevented.—Hindered. *Lat.* **præ**, before; **vĕnio**, to go.

Coöperation.—Working together. *Lat.* **co** (for con), together, **operor**, to work, take pains. (*Note* that the diæresis, i. e. the two dots over the second *o*, shows that it is to be in a distinct syllable from the first.)

Expenditure.—Payment. *Lat.* **expendo**, to *weigh* out, because money was formerly weighed.

Estimable.—Valuable, worth having. *Lat.* **æstimo**, to hold dear.

Pauperism.—Abject poverty. *Lat.* **paupertas**, need, want, indigence.

PRONUNCIATION. Exercise on sounds in

pansy, sense, example, ounce, loin, juggler, lounge, trunk,
cucumber, amount, font, front, bounty, country.

CHILDREN are frequently employed by their parents, or others, to fetch articles from the shop and pay for them. They should take pains to learn which are the best articles, and why they are the best, so that they may hereafter be able to judge for themselves. They should also find out what is about the proper price for goods of such and such a kind, that they may not hereafter be imposed upon.

It is the plain duty of every person to pay for whatever is bought; and the best way is, always to pay at once in cash. In many shops one may see printed up in large letters, "**Ready money only,**" or "**For**

cash only." Money is called **cash**, from the French word **caisse,** which means a box into which money was put. Of course, if the money were put into the box, it would be ready money. Such a box was once carried from house to house by those who went about asking for gifts at Christmas or New Year's time, and this gave rise to the term **Christmas box.**

It would be an excellent plan if all shopkeepers would adopt the ready-money system, as it is called. It would be far better for them, as they would then have no bad debts, which they must, of course, make good, out of the honest people who buy of them. A shopkeeper cannot live on bad debts. He is therefore compelled to charge more for his goods than he would have to do, if he were certain that everyone would pay him. If all customers pay ready money, he can afford to charge less, than if he have to trust them a month, or a quarter of a year. It would be far better also for those who buy, if they were compelled always to pay ready money, for several reasons. They would obtain what they want somewhat cheaper, as we have seen. They would be prevented from being dishonest, which of itself would be a grand gain. Some people do not think it dishonest to buy and not pay, but it really is quite as dishonest as direct stealing, and for this reason. If a woman be caught stealing, she can be sent to prison; but if she buy, without intending to pay, she cannot. It is sad to think that those who buy, without meaning to pay, are always very profuse of promises to pay next week, or very soon. It is so easy to promise. It is as easy as lying, and is sometimes only another name for that dreadful sin.

The great secret of the success of Coöperative Stores is, that their customers are required to pay cash. It is also to be remembered that, as a rule, large, good shops can afford to sell cheaper, than poor and small ones.

The shopkeeper must be skilled in choosing and buying, and must have capital, or money in hand, to buy plenty of goods. Shopmen are sometimes eager in persuading people to buy, saying that some things are to be had cheap; and the unwary may be entrapped into buying. But always bear in mind, that really good things cannot honestly be cheap. They must have a proper price. If they be sold for less than that, either those that made them are cheated, or those that sell them must be losers. There may be an exception to this, as when a thing is sold below cost price, on account of its being either out of fashion or second-hand. It is true that needlework is sometimes so badly paid for, that it is shamefully done. Buttons, for example, are sometimes sewn on shirts with one thread only. This is simply dishonest. If the girls or women be not paid sufficient for doing the work well, they are robbed by their employer. Shirts are just as dear as if the sewing were first-rate. In any case the makers ought not to do dishonest work, and should refuse to do it without proper pay.

Besides being able to pay for anything that is bought, the buyer ought to think whether she will be able to buy another thing as good, if the first be soiled, spoiled, or worn out. It is better to go upwards than to go downwards in buying, as in other things. This is one of the things which maidservants, and indeed most young learners, forget. They buy any kind of stupid finery, instead of the best and most serviceable articles to wear, to look respectable, and last a long time.

Some people prefer to pay their bills quarterly.

They perhaps receive their wages, or their salary, quarterly, and so they pay their bills in the same way. This is a good plan. But it is far better always to pay ready money. This leads to many virtues, honesty, thrift, and providence among the number. There is one thing which it will certainly lead to if steadily persisted in, and that is, a hatred of bills. Anyone who hates the sight, or the possession, or the knowledge of unpaid bills, will be pretty sure not to get into debt. Whatever you do, however you dress, however you live, be proud in one respect, **be proud that you are not in debt.** It is a noble and honourable pride. Debt is a pit of destruction, in which all bad things are possible.

Whether then her earnings be great or small—**everyone should keep accounts.** Some people think, because they have not much to spend, it is useless to keep accounts. This is an ignorant objection. Others do not keep accounts because it takes time, and causes trouble. This is a lazy objection. Everything that is valuable in any way takes time and trouble to obtain. Weeds grow fast enough without the expenditure of labour upon them, but apples and potatoes don't. Weeds **give** trouble enough, and so do debts. Others remark, that putting down exactly what they spend on everything, does not make them have any more to spend. This objection is partly true, but mostly false. Putting down what is spent, does not indeed increase the number of actual shillings or pence any girl has to spend; but the knowledge that every penny is to be put down, helps her to think whether the proposed expenditure be really necessary, and whether it can, by any arrangement, be done without. Further, when the accounts are made up at the end of each month, quarter, and year, those who keep them, can see in what they may be able to save at another time, if it be necessary to do so; as, for example, if they know that their future income will not be so much as it has been in the past. Keeping accounts carefully prevents people from living from hand to mouth, as the saying is, one of the worst of all ways of living, except, perhaps, stealing and pauperism. There are some working people also, who, if they earn thirty shillings one week, will eat and drink it all. It may be that next week they earn ten shillings, or nothing, and then they are not a bit ashamed to beg from those who, perhaps, regularly live on a pound a week, or less. The best housewives, housekeepers, and the most careful and estimable people invariably keep accounts.

A woman who has learnt to keep accounts exactly and well, has learnt the value of money; knows what things cost, and how easily money runs away. For these reasons, she is worth a great deal more, as a wife, to a hard-working, honest man, than one who knows nothing about keeping accounts.

Moreover, if she have learnt these things, she will be too wise to marry a man whom she has reason to know is not hard-working and honest. If a man smoke, and drink, and be careless of his money, is it likely that he will ever make a good husband? It is a wife's duty to try and make her husband's home happy; and it is well to think of these things before it be too late. A woman should be ashamed to beg; should manage her income so that she never gets into debt; and never omit to keep a faithful record of every halfpenny she spends. Good habits are best learnt in youth; and keeping accounts helps to teach one of the most difficult lessons anyone has to learn, viz. how to spend well.

LESSON XLVI.

THE DUTY, HAPPINESS, AND RESPECTABILITY OF SAVING.

DERIVATIONS.

Interest, *Fr.*—The sum paid per cent. per annum for the loan of money.

Misfortune.—Mishap, mischance. *A.-Sax.* **mis**, wrong; *Lat.* **fortūna**, chance, hap, luck, fate.

Corresponding.—Answering to. *Lat.* **cor** (for con), and **respondĕo**, to promise.

Thrift.—The habit of carefulness, economy. From the verb *thrive*, perf. *throve*, p. p. *thriven*. (Cf. drive, drove, driven, drift.)

Practice, *Gr.*—The doing a thing over and over again. Notice, the verb is practise.

Relief.—Help, aid, assistance. Verb, relieve. *Lat.* **relevo**, to lighten.

Metropolis.—Capital, mother city. *Gr.* **mētēr** (*Lat.* mater), mother; and **polis**, a city.

Example.—Something worth imitation. Cf. **sampler** in needlework. *Lat.* **exemplum**, anything selected as a model or pattern.

Manufacturing.—Making literally by hand, but now by machinery. *Lat.* **manus**, the hand; **factūra**, a making (**făcio**, to make).

Squandered.—Carelessly lost, or thrown away.

Periodical.—Happening at set times, e.g. tides, full moon, the seasons, &c. *Lat.* and *Gr.* **pĕrĭŏdus**, a complete circuit.

Character, *Gr.*—Stamp, mark, impression, like the impression on a coin or medal. A good character is therefore well stamped.

Education.—Training, leading out of anyone's character. *Lat.* **ēdŭco**, to bring up a child.

Respectable.—Having a good name, honest, pure. *Lat.* **respecto**, to respect.

Detriment.—Harm. *Lat.* **dētrīmentum**, loss, damage. Literally something rubbed off (**detĕro**, to rub off).

PRONUNCIATION. Exercise on words of uncertain origin, sounds of *A*, *AI*, *AU*.

fray, darn, dairy, bald, bale, sale, scare, lace, blaze, maze, lazy, canter, wanton, dainty, drain, frame, sham.

It is the obvious duty of everyone who earns money, in any way whatever, to save some of it. The poet

Goldsmith excites a smile on the reader's face when he describes the parson of Sweet Auburn, the deserted village, as—

> "Passing rich on forty pounds a year."

Perhaps it may be thought that a man could not be rich on forty pounds a year. But it ought to be remembered that a person is rich, not in proportion to income, or to outgoings; but rather in proportion as income is greater than outgoings or spendings; i. e. in proportion to savings. Therefore, if anyone's income be forty pounds a year, and the outgoings amount only to thirty, then that person is rich to the extent of ten pounds. In ten years, at the same steady rate of saving, if the money were put out to interest, as it ought to be, the riches would amount to more than a hundred pounds.

It is the duty of every girl to endeavour to save, because it is everyone's duty, not only to earn her own bread, but also to try and support those who may be dependent on her. Then, too, she may not always be able to work, owing to sickness or accident; and these misfortunes ought to be thought about beforehand, and not to find her penniless if they come.

Some children never think that they can do any better with a penny, or a shilling, than spend it. So they forthwith buy sweets with the penny, or a toy with the shilling. The first are eaten at once, and the last broken in a week. Both sweets and toys are very excellent things in their way, but it is a very bad habit to spend all little gifts or earnings upon them.

Every child should have a money-box, into which any gifts of friends, or any little earnings, may be put

The box may be opened at the year's end, and the money placed in the savings bank; or it may be then used to buy something really useful. Children, as a rule, are proud of what they buy with their own money. This is a proper pride. By saving up in this way for anything their parents approve of, they are taught the value of money; a very important lesson to learn, and one which at present is mastered only by a few. Some young people get into debt because they have no notion of the value of money, how hard it is to earn, and how still more difficult it is to keep.

There is a great happiness in saving, which unthrifty people quite miss, without reaping any corresponding advantage. A very large part of the distress in the world is caused by thriftless habits. In times of distress, when trade is bad, or work is scarce, those who have saved nothing, must be maintained by those who have. This is not fair. Those who have saved have done so by being careful, frugal, thrifty. They have not spent every shilling of their wages on food or clothes, but have practised some self-denial. Those, on the contrary, who have practised no self-denial, who have been selfish, and have spent everything they earn, regardless of the future, disgrace themselves by having to beg for relief. It is known, for example, that there are more than eighty thousand [1] paupers in

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[1] In the last week of 1877 the total number of paupers in the metropolis was 83,058, of whom 40,026 were in workhouses, and 43,032 received outdoor relief. In the fourth week of October, 1878, there were 77,660 paupers in London. Compared with the corresponding weeks in the years 1876, 1875, and 1874, these figures show a decrease of 478, 4949, and 14,299 respectively. In the year 1878 there were no less than 719,849 in England, the amount paid to whom was £7,400,034.

London alone; that is, there are as many people in our great metropolis who have absolutely nothing, as there are inhabitants in large towns like Norwich, Brighton, Bolton, Wolverhampton, Nottingham, or Oldham. Of course, it ought never to be forgotten that the young, the sick, and the aged, must be relieved. Too many of the rest do not deserve such help. When those in very severe distress are asked, how they came to be in so bad a state, if they answer honestly, they will generally have to say it was their own fault.

In mining and manufacturing districts there are occasionally periods of terrible distress. Thus at the close of the year 1877 there was fearful poverty in South Wales. Some men and boys were described in the newspapers as going to work without food; and the condition of the wives and children at home must have been dreadful. But a few months before these same miners were earning very high wages, and instead of saving anything they had simply squandered the whole in eating and drinking, or in a strike of long duration the preceding year, which drove trade away from the district. If girls would learn to save, would practise saving as they grow up, would become thrifty, careful, and provident wives, and would teach their children to be like them, these periodical distresses, which make people shudder to read about, need not occur nearly so often or be anything like so severe as they are now. If workpeople spend their money in drink, or wilfully destroy their employers' capital by strikes, they deserve to suffer. That is a dreadful thing for a girl to learn, but it is fearfully true, and she ought to know it. There is a proverb which says "Forewarned, is forearmed," and another, "A penny saved is a penny gained." S. Paul says this—"**If any will not work neither shall he eat.**"

"It is certain that when poverty succeeds riches suddenly, weak characters are apt to lose self-respect." Their straitened circumstances, however, are not; but the foolish pride they had previously displayed in spending, is, in reality the root, or cause, of their loss of self-respect. The fact is, they had no true self-respect then. The dangers of such a condition of mind are obvious. It is well known that the absence of self-respect is one of the commonest traits in the characters of criminals. Humiliation leads to despair, and despair to crime—in most cases at any rate where there is not good religious principle. "Poverty is no sin"—is sometimes said as an excuse. The truth of this depends on what was the cause of the poverty. If drink were the cause, then poverty is but the due punishment for a previous sin, and one that may be expected to lead to many others.

It is true that part of the reason for reckless spending on food, drink, or dress, is very often the want of education. If people have no higher notion of pleasure and enjoyment, than eating, and drinking, and dressing, we cannot wonder that they indulge themselves in these whenever they can. A pig enjoys eating and drinking, and a peacock has very fine feathers. But very few people would care to be placed on a level with pigs; or would like to make so discordant a screech as the peacock does, in order that they may attract attention to their ribbons, or their dresses. When girls spend their money absurdly on dress, they only get laughed at behind their backs, which is all they have any right to expect.

Soup-kitchens are established as a rule in times of severe distress; and those who are grateful enough for the relief then, would perhaps turn up their noses at the soup when they are earning good wages. If they would learn to make good soup for themselves by turning to account what they wasted when they were well off, they might probably never have to be dependent on the kindness and self-denial of others. If they be so dependent, they are rarely grateful; and when the distress is over they often become as extravagant and impertinent as before, or perhaps more so.

But besides the duty and the happiness of saving, there is also a respectability in it. All people, very properly, like to be considered respectable. Every girl should insist upon being so regarded. The only way to be considered respectable is to be respectable. Such girls are soon known because they are well-mannered to their superiors, hard-working, trustworthy, and honest as daylight. They may be trusted either with money or character. They will neither steal, nor waste the one; nor say anything secretly to the detriment of the other. Yes; be respectable girls, all of you.

If you know anyone who has saved a little money, and partly or entirely bought the house he lives in, you will perceive at once the wide difference there is between the respectability of the saving, and the want of self-respect of the beggar, the pauper, and the thriftless. It is to be hoped that all who read this lesson will remember their duty in the matter. The pinch of want, and cold, and suffering, will not be much cared for by those who have learnt and practised the duty of saving, and who have found out its happiness and respectability.

Note from the 'Times.

"Everyone should learn that idleness, even when ordered by a Trades Union and dignified by the name of a strike, is none the less a contravention of a primary law of human existence, and leads inevitably to want and to misery. A strike is a deadly weapon, generally more fatal to those who use it, than to those against whom it is directed. Thus in the late wicked strike in the cotton trade of Lancashire (June, 1878), not less than £30,000 was lost in wages alone, and that by weavers only."

And see the notes on p. 236.

LESSON XLVII.

"NEITHER A BORROWER NOR A LENDER BE."

DERIVATIONS.

Husbandry.—Carefulness; also, agricultural labour. The husband is the bond, or band, or stay of the house.

Neighbour.—Near person. **Boor**, a peasant.

Peculiarly.—Specially. *Lat.* **pĕcūlĭārĭs**, relating to private property.

Plausible.—With plenty of good seeming. *Lat.* **plausibilis**; but the Latin word means what deserves applause, and the English means just the opposite.

Reminded.—Remembered.

Improvident.—Careless, unforeseeing. *Lat.* **im**, not; **pro**, before; **video**, to see.

Calculation.—Summing up, careful pondering or thinking over. *Lat.* **calculus**, a little pebble, because pebbles were used to count with.

Mutual.—Interchangeable; equal on both sides. *Lat.* **mutuus.**

Miserable.—Poor, poverty-stricken, wretched. *Lat.* **miser.**

PRONUNCIATION. Exercise on sounds of *E*, *EA*, *I*.

merry, pert, measles, scream, beg, cheat, girl, filbert, a trice, tiny, shrimp, pig, tickle, fit.

WHEN, in Shakspeare's play of Hamlet, Polonius gives advice to his son Laertes who was about to travel, he says, "Neither a borrower nor a lender be," and the reason he urges is—

> "For borrowing dulls the edge of husbandry,
> And loan oft loses both itself and friend."

All have to travel, through life at any rate, if they do not go abroad; and whether they go to other countries or remain at home, the advice of Polonius is as applicable to every girl as it was to Laertes.

Never borrow, he says, never lend. If you can borrow easily you will be the less likely to work honestly. Everyone knows that if a sharp carving knife were chopped against a piece of hard wood, its edge would be dulled, or taken off. So husbandry, that is carefulness which comes of hard, honest work, and provident saving, is dulled by borrowing. Then, if you lend anything, the chances are great that you will not get it back. What you lend is a loan. The loan loses itself, says old Polonius, and loses for you the friend to whom you lent it. There is a proverbial saying with a good deal of truth in it: "If you want to get rid of an acquaintance lend him five shillings." It is generally expressed thus, "If you want to get rid of a **friend**," but friends are too scarce to be got rid of on any terms, if they be real friends. Very few people have many friends. As the word is generally used, it has no meaning at all.

First, of borrowing. Girls should be above borrowing. It is mostly selfish to borrow. The practice arises from carelessness, thoughtlessness, or laziness, faults to be corrected as soon as possible. Girls who borrow will become women who borrow. Some women are always running to their neighbours to borrow a saucepan or a bread-tin, or half a stone of flour, or a few coals. In too many cases the neighbours have not the moral courage to say no; and so the saucepan is brought back dirty, the bread-tin broken, and the flour and coals not at all. Borrowing of this sort is only a polite method of stealing.

One sometimes sees loans advertised, e.g. "**Any sum from 10*l.* to 100*l.* lent at once without inquiry and without security.**" Those who believe, and are taken in by such stuff as this, would believe also that the moon is made of green cheese. There is only one thing to be done with loan offices, and that is, avoid them.

Second, of lending. Girls as a rule should refuse to lend. It is everyone's duty to be kind to, and help her fellows, as much as possible. But she may benefit them far more by teaching them to remember and supply their own wants; than by lending anything to them and so encouraging them in carelessness, thoughtlessness, or laziness. Right ways of benefiting peoplo are good; rash, emotional ways of giving assistance are as a rule wrong. It is easier to lend, than to say no. But it is mostly easier to do wrong, than to do right.

In the parable with which I hope you are all familiar, when the five wise virgins were asked to lend oil to the five foolish ones because their lamps were gone out, they refused. It was true that the foolish virgins would not be allowed to go into the wedding feast without lighted lamps, but they should have thought of that beforehand. They knew that fact as well as the wise ones. If the wise had lent the foolish oil, they would not have been wise; and this truth applies to most lendings.

Some extremely sad cases have been known to the writer of this lesson arising from improper lending. Here is one. An old servant in a clergyman's family had saved by great carefulness two hundred pounds, very nearly sufficient to purchase an annuity, that would have been enough for her to live upon comfortably for the rest of her life. In an evil hour, she was persuaded to lend it to a distant relation, to start a small shop. The shop failed, and she, lost all her money. She was nearly sixty years old when this happened, and so of course she could not begin life again.

There are probably very few men, or women, who are not acquainted with some sad cases of this sort. If persons wish to start shops they should be left to do it with their own money; and then as they will know the cost, they will most likely be careful as to what they are about. In any case they should not borrow money, which they are not absolutely certain they can pay back. It is not meant to be denied that a loan to an honest, and respectable person, *may sometimes* be of great service.

Servant maids, and young women generally who have earned and saved a little money, are peculiarly liable to teasing requests of this kind from borrowers. If they be good-natured, they are prone to believe almost any sort of plausible story they are told; so they lend and lose both their money and the friendship (if we may venture so to misapply the term) of the person to whom they lent. Nothing is so great an annoyance and offence to a person who has borrowed, as to be asked to pay back. No request for repayment ought to be needed. Of course when the money was borrowed numbers of promises were given to repay; and equally of course they have been broken. So a request to repay is a reminder of broken promises, bad faith, cheating, not to say lying. And no one likes reminders of this kind.

Remember then, **Never lend money to anyone.**

It is not a kindness. If we can afford to give or lose, that is another thing. Then we may "**Do good and lend, hoping for nothing again.**" But even so, the amount of good we do is very questionable, unless we, and the borrowers, both distinctly understand, that what we lend is in reality given. The nearest relations have no more right to borrow of each other in this way, than those who are not at all akin. There are scores of instances of sisters being ruined by lending their all, to improvident, or careless, or even wicked brothers. Far from its being part of their duty to lend in such cases; it is a very distinct part of their duty not to do so. Why are they to make themselves dependent on others? Is it right that they should risk coming to the union for relief that some one else may be a spendthrift? Borrowing of this sort is only stealing at second-hand.

There are very few people who have not lent and lost. Most of them are sore, when they think of their hard-earned money being foolishly given to some one else, in whose word they believed they could trust. If they think over the matter, and will honestly admit the result of lending the money; they will in most cases be compelled to say, that they did harm rather than good. If a borrower neglect to pay what he has promised, he becomes a rogue. To make anyone a rogue is a bad action, to be avoided at all costs.

Perhaps these things sound harsh. Are kindness, mutual help, unselfishness, neighbourly charity, to be done away with then, it may be asked, to foster self-calculation and self-seeking? A thousand times no—if saying no a thousand times will make the denial more emphatic and more valuable. We are to be kind to one another. It is the only road to happiness. But lending is, as a rule, the greatest unkindness we can be guilty of, unless, as we have already said, we can give. Then, if we be repaid, it is a great pleasure that we have been able to do a kindness; and if we be not, it does not matter. We did our best to do a kindness.

We owe mutual help to all with whom we come in contact, and they to us, as the word mutual signifies. But if we can lend we do not want to borrow, so there is nothing **mutual** in that. It is all on one side.

It is our greatest happiness to be unselfish. Those who are selfish are truly miserable, whether girls or women. A selfish girl's face often looks sour. It wants to find fault with something, perhaps with everything. There is seldom a pleasant smile on it, because there is not a helpful mind and heart behind it.

But surely it is not a great mark of unselfishness, to lend a person five shillings in order to get rid of him. Opportunities for neighbourly charities are always present, and are embraced among the very poorest. And those who take most delight in doing charitable things, are those who sometimes are the most imposed upon. It is possible to be taken in in this way, until all kindness and mutual help, all unselfishness and neighbourly charity, are killed in a person. But this is a terribly sad loss; so all should be careful in time. To lose a small loan may not hurt anyone much; but to lose one's faith in the solemnly pledged word of a friend, is a very great loss, and one that it is utterly impossible to make good.

There is a form of lending which requires stern condemnation. It is that of making presents, more or less silly, or more or less costly, in order to receive presents again. In case anyone ever makes such a present to any of you, refuse it, if the giver has no right to present anything to you; and if you receive it, do not make a present back because you have had one. A little thought will enable anyone to decide the motive of a gift, and whether the giver has a right to give or not. Presents on such terms are insults, or loans, and begging in disguise.

The above paragraph does not touch little presents of kindness and affection, as birthday or Christmas or New Year presents, or presents of real friend to real friend, or child to parent, which are among the keenest pleasures a right-minded person can enjoy; they form part of the amenities of life and of the blessings which make life worth living. And ONE said "It is more blessed to give than to receive."

It is your duty, then, neither to beg, borrow, nor lend, still less to steal; which is too often wrapped up in the cloak of begging and borrowing.

But it is your duty not to lend but to give to your parents whatever they want. Let them have your love first of all. If they have been able to provide for you, be thankful, and make good use of your blessings. If they have had to work hard to feed and clothe, educate and start you in life, in however humble a way, it is your duty to remember their grey hairs. What son or daughter would eat his parents' bread, wear the clothes paid for out of their hardly-earned, hardly-saved money, and then, when he or she grew up, leave them to starve, or to the care of the relieving officer, or to the chill of the workhouse? surely none of you who read this book. If you do, there is no word of contempt that would adequately express your baseness and ingratitude.

LESSON XLVIII.

THE UNION. PARISH RELIEF. KNOWLEDGE IS POWER.

DERIVATIONS.

Vagabond.—A wanderer, one with no home. *Lat.* **vagor,** to stroll, roam.

Collection.—A placing together of small amounts. *Lat.* **col,** for con, together; **lectio,** a gathering.

Vagrancy.—The state of vagrants or beggars. *Lat.* **vagor.**

Parish.—A small ecclesiastical and poor-law division of a county.

Incorrigible, *Fr.*—That which cannot or will not be corrected.

Impotent.—Weak, unable, incompetent. *Lat.* **im,** not; **potens,** able.

Apprentices.—Those bound by indentures to serve some one in order that they may be taught his art or trade.

Mitigation.—A making less. *Lat.* **mītĭgo,** to make gentle.

Charitable.—Kindly. *Lat.* **cārĭtas,** love. Charity is not almsgiving.

Calamities.—Troubles. *Lat.* **călămĭtas,** damage, injury, loss, misfortune, adversity.

Accidents.—Things that happen or fall by chance. *Lat.* **ad,** and **cado,** to fall.

Indiscriminate.—Without thought or care. *Lat.* **in,** not; **discrīmĭno,** to divide, distinguish.

Organization.—Arrangement. *Lat.* **orgănum,** an instrument.

Colonies.—Settlements of people in distant lands under the government of the mother country. *Lat.* **colonia; cŏlo,** to cultivate.

Emigration.—Going to a colony. *Lat.* **e,** out and **migrātio,** removal, change of habitation.

PRONUNCIATION. Exercises on sounds of *O, OA, OI, OU, OO.*

a row (noise), orts, coarse, afford, moil, douse, souse, jostle, bounce, fond, bonfire, donkey, pony, roam, oakum, coddle, coke, moidered, flout, pother, bother, booby.

"THE poor shall never cease out of the land," until everyone in it shall obey the will of God "with all his heart, and all his mind, and all his strength." This was true of the Jews, and is equally true of the English. The word poor, here, is to be understood as meaning pauper, a destitute person; therefore, anyone who can earn a living is not poor in this sense.

It is our duty to provide for the really destitute, and the arrangements which Englishmen make for the poor are regulated by certain laws.

It will be instructive to consider briefly the history of poor laws in England.

About five hundred years ago, in the reign of Richard II. (1377–1399), the first mention is made of **impotent poor,** i.e. of poor unable to work. But it was not until the reign of Henry VIII. (1509–1547), that a definite law about the poor was made. In 1530, a severe law was passed. It inflicted sharp punishment on sturdy vagabonds and valiant beggars, viz. on such as were able, but not willing, to work. Those who were old and unable to work, had letters given to them authorizing them to beg within certain districts. It was in 1535, however, i.e. nearly three hundred and fifty years ago, that the first Act for the relief of the poor was passed. By it collections were ordered to be made in parishes for their support. The same Act made incorrigible vagrancy, upon the third conviction, a felony, punishable by death. Sturdy beggars were to be whipped behind a cart through the parish in which they were caught.

It was in the reign of Queen Elizabeth that compulsory assessment for the relief of the poor became law. Lands and houses were assessed or rated at so much in the pound. Thus, if the land were worth 20*l.* a year, and the poor rate was 6*d.* in the pound, the owner had to pay 10*s.* poor rate. The overseers of each parish were directed by this statute to raise by taxation the necessary sums, "for providing a sufficient stock of flax, hemp, wool, and other ware or stuff, to set the poor on work; and also competent sums for relief of lame, blind, old, and impotent persons; and for putting out children as apprentices." The justices were empowered to send to prison all who would not work. Parochial authorities were permitted to build poor-houses, but for impotent poor only.

In the reign of George I., **workhouses**, which still exist in many country parishes, were first built. The workhouses were a sort of manufactory, and were not so much refuges, as places where what is now called the **labour test** could be applied. They were successful at first, but were subsequently so badly managed, that the poor rate in England increased from 1,720,000*l*. in 1775, to 8,000,000*l*. in 1818. Some of the abuses were caused by paying the wages of labourers from the rate; so that farmers got their work done partly at the cost of the parish. Then, as extra relief was given for married persons, and for every child born, early and improvident marriages were encouraged. Young men married, not because they could maintain wife and children, but because they got more money when they were married, whether they worked or not. These evils were partly done away by the Poor Law Amendment Act of 1834, which is the law now. This Act established Poor Law Commissioners in London, who exercise certain powers over all local boards. The workhouses were abolished, parishes were authorized to join together and form **unions**.[1] Union workhouses were then built for these parishes so united, and it was at first ordered that relief should be given to able-bodied poor only in the house, but this has not been as carefully attended to as it ought to have been.

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[1] *The Administration of Poor Relief.*—The President of the Local Government Board (Mr. Sclater-Booth) has just issued a circular to boards of guardians throughout the country relative to the manner in which poor relief is now administered. In 1871 orders were issued with a view to the more stringent application of the Poor Laws; and the consideration and application of those rules have not, Mr. Sclater-

One of the most difficult questions of to-day is, shall the poor receive **outdoor** or **indoor** relief? It is certain that outdoor relief is more liable to misuse than indoor. But it is very hard that homes should be broken up, and all the inmates sent to the union, in any case of unmerited distress. But if the distress be merited, as if it be brought on by bad conduct, such as drunkenness or dishonesty, or by strikes, then there is very much to be said in palliation of the apparent harshness of the law. The greatest of all evils connected with the poor rate, perhaps, is, that some children are bred paupers, and are brought up to consider that it is right, instead of wrong, to be dependent on the work of other people. Another evil, which, however, we hope is fast dying out, is, that good and charitable people are cheated and swindled out of their money by designing beggars. Many of the most undeserving can whine, and tell a long story of calamities and troubles, if they think anything is to be got by it. But this is a deplorable and degrading form of dishonesty. There are other persons, however, as noble as these are base.

Booth now points out, been without effect. In the year 1870–71 the expenditure on out relief throughout the country was 3,663,970*l.*; in 1876–77 it had fallen to 2,616,465*l.*, thus showing a decrease of over a million pounds, or 28·6 per cent. The number of outdoor paupers in January, 1871, was 917,890; whilst the number in 1877 was 571,982, or a decrease of 345,908, or 37·7 per cent. The circular further states that, notwithstanding the decrease of outdoor relief, no complaints of hardship have come under the notice of the inspectors, and that many suggestions, which will receive consideration, have been received as to the still more stringent application of the relief laws.

The noble ones say they would rather work their fingers to the bone, than go about whining and telling lies. Those people who talk loudest about their troubles and distresses, generally have the least to bear. "Great cry and little wool," says the proverb. When everyone knows and acts upon this, beggars will most likely leave off begging, and try to earn their bread.

It is to be hoped that every girl who reads this lesson, and knows a little of the history and object of our poor laws, and something of the baseness and meanness of living out of the hard earnings of others, will be above begging, and taking parish relief.

Accidents may happen. Real, unmerited distress, is by no means rare. Misfortunes are brought upon some by the bad conduct of others. And there may be cases where relief is not only necessary, but deserved. The difficulty is to get to know these really deserving cases, because persons who have real distress to bear, bear it, as a rule, so quietly and so uncomplainingly. They pinch, and pawn, and sell, and starve, all the while remaining clean and respectable. These are the persons who ought to be relieved, and not those who are ragged and dirty, and able, with a tearful face, to tell a long tale.

Most people know now that indiscriminate almsgiving is wrong. It is simply a sin. It encourages vice, and laziness, and lying. If there were no unwise givers, there would be no beggars. Begging is a crime, and ought always to be punished as such. For the most part now it is only those who are poor themselves, who relieve beggars; and they will soon learn that they are doing no good by it.

In most of our large towns there are now **Charity Organization Societies** established, and the amount of good these have done, by unmasking sham distress, as well as by finding out and relieving real and undeserved want, is astonishing. There is work for all who will work and be honest. There is bread and to spare for all who will work, be honest, and save. If there be no work in England, the Colonies of Australia, and the Dominion of Canada, and New Zealand, are anxious to have able-bodied men and women, and especially young men and young women of good character, sent to them. Free passages are given to many of these colonies, and those who go are tolerably certain to find good work, good food, and good wages. Free grants of land are also given in many cases. Let emigrants remember only that they must be honest and sober if they mean to succeed.

Learn geography well then, that you may know something about emigrating to these colonies, if you should ever fail to find suitable employment and proper pay in your own country. The Queen is queen there just as much as here, and there are churches and schools quite like our own.

Learn your domestic economy thoroughly, and how to do your needlework well. Learn, above all, to think that it is a first-rate thing to earn your own living, to be independent, and to be able to help others.

It has been said that knowledge is power, and the saying is quite true when properly understood.

Knowledge of the history of the poor law, gathered from even so short an account as it has been possible to give in this lesson, is power, if it enable you to live so, that you and yours will never, from any fault of your own, come under the action of it, never know who the relieving officer is, or where the union is. You will always have to help the aged, and the impotent, which is right enough; but even such aid should in time become less common, for only very few ought to need it.

Knowledge of the Charity Organization Society, and, of all sorts of Aid Societies, is power, if it make you above applying to them, except when you cannot help it, when you are really driven to it, and then by no fault of your own. If by the selfishness or wickedness of others, or by any unforeseen accident, it become necessary to apply; then, if you be thoroughly honest, hardworking, and trustworthy, you will certainly be helped. But if any one have to claim parish relief, for any preventable cause, he or she ought to be compelled to earn and pay back the money.

Knowledge of emigration is power. There are work, and food, and clothing, and recreation too, for all who will be sober, honest, hardworking, and prayerful, if not at home, then in the Colonies. Knowledge is power to every girl who will read and remember the following extract from a working man's letter:—

> "I wish I could write in some tolerable good style, so that I could idealize, or rather realize, to folks the life and love and marriage of a working man and his wife. It is in my opinion a working man that really does know what a true wife is, for his every want, his every comfort in life depends on her; and his children's home, their daily lives, and their future lives, are shaped by her.
>
> "Napoleon wisely said, 'France needs good mothers more than brave men. Good mothers are the makers, or shapers, of brave men.' I cannot say that these are the very words, but it is the import of his speech on the topic. We have a saying amongst us (at Sunderland):—
>
> "'The man may spend
> And money lend,
> If his wife be aught;
> But he may work
> And try to save,
> But will have nought
> If his wife be naught.'"
>
> Ruskin, 'Time and Tide,' p. 208.

If his wife be **aught** means if he have a good wife. If his wife be **naught** means if he have a bad or thriftless wife.

In Sir Walter Scott's 'Fortunes of Nigel' is a proverb that all respectable thrifty women and all working men will agree to—

"When women gad,
The house goes mad."

THINGS WORTH KNOWING.

From a Canadian newspaper.

1. That fish may be scaled much easier by dipping it into boiling water about a minute.
2. That fish may as well be scaled, if desired, before packing it down in salt; though, in that case, do not scald it.
3. That salt fish is quickest and best freshened by soaking it in sour milk.
4. That milk which is turned or changed may be sweetened, and rendered fit for use again, by stirring in a little soda.
5. That salt will curdle new milk; hence, in preparing milk-porridge, gravies, &c., the salt should not be added until the dish is prepared.
6. That fresh meat after beginning to spoil will sweeten if it be placed out of doors in the cool, over night.
7. That clear boiling water will remove tea-stains and many fruit-stains. Pour the water through the stain, and thus prevent it spreading over the fabric.
8. That ripe tomatoes will remove ink and other stains from white cloth, also from the hands.
9. That a teaspoonful of turpentine boiled with your white clothes will aid the whitening process.
10. That boiled starch is much improved by the addition of a little sperm, or a little salt, or both, or a little gum-Arabic dissolved.

11. That beeswax and salt will make your rusty flat-irons as clean and smooth as glass. Tie a lump of wax in a rag, and keep it for that purpose. When the irons are hot, rub them first with the wax-rag, then scour with a paper or cloth sprinkled with salt.

12. That blue ointment and kerosene, mixed in equal proportions, and applied to bedsteads, is an unfailing remedy for vermin; and that a coat of whitewash is ditto for the walls of a house.

13. That kerosene will soften boots or shoes which have been hardened by water, and render them as pliable as new ones.

14. That kerosene will make tin teakettles as bright as new. Saturate a woollen rag and rub with it. It will also remove stains from clean varnished furniture.

15. That cool rain-water and soda will remove machine-grease from washable fabrics.

THE USE OF PRESERVED MEATS.

The following are the instructions just issued by command of the Duke of Cambridge for preparing and cooking preserved meats, and may be of public interest. They have been drawn up by the staff officers superintending the instructional kitchen at Aldershot:—

The Australian and American preserved meat issued to troops having been already cooked in the process of preservation, must on no account be heated for any length of time when being prepared for use. The vegetables should be cooked separately, and the meat added only sufficient time before serving to warm it through. The following receipts, the ingredients of which are proportioned for messes of 22 men each, if carefully prepared, afford a variety of dishes in a palatable form:—

Meat Pie.—Ingredients: 16½ lb. of meat, 5 lb. of flour, 1½ lb. suet, 1 lb. onions, 2 oz. salt, ½ oz. pepper. Make the paste, cut up and stew the onions, with jelly from the meat added; cut the meat into dice, and place it in a baking dish; add the cooked onions, season with pepper and salt; cover with a light crust, and bake in a quick oven for 20 minutes.

Stew.—Ingredients: 16½ lb. meat, 2 lb. carrots or other vegetables, 1 lb. onions, 2 oz. salt, ½ oz. pepper. Cut up the vegetables and onions, which place in the boiler with sufficient water to cover them; add some jelly from the meat, well season with pepper and salt, and stew gently, keeping the lid of the boiler closely shut till the vegetables are tender, then add the meat; let the whole simmer for 10 minutes, and serve.

Curried Stew.—Ingredients: The same as for stew, with 1 oz. of curry powder and 1 lb. flour added. Prepare as for stew; mix the curry and flour with cold water into a smooth batter, and add it to the stewed vegetables with the meat; let the whole simmer for 10 minutes, and serve.

Sea Pie.—Ingredients: The same as for stew, with 5 lb. of flour and 1½ lb. of suet or dripping added. Make the paste, prepare and cook the vegetables and onions as for stew; when the vegetables are tender add the meat; cover the whole over with a light paste, and boil or steam for 20 minutes. A thickening of flour is an improvement, and the most suitable vessel in which to make this dish is Warren's cooker.

Toad-in-the-Hole.—Ingredients: 16½ lb. meat, 5 lb. flour, 1 lb. suet or dripping, 2 oz. salt, ½ oz. pepper, 1 lb. onions, 6 eggs, or equivalent in egg powder, and 1 pint of ale. Cut up and cook onions, prepare batter with eggs and milk if possible, if not, with beer and water; season it with half the pepper and salt; grease inside of baking dish, pour in half the batter, and place it in oven; when batter sets place on it the meat, cut up, and the cooked onions; season with remainder of pepper and salt, pour rest of batter into dish, so that it just covers the meat, and bake from 15 to 20 minutes in a quick oven.

Potato Pie.—Ingredients: 16½ lb. of meat, 20 lb. potatoes, 1 lb. onions, 3 oz. salt, ½ oz. pepper. Cut up and stew onions with jelly from meat added, boil or steam potatoes, and mash them. Grease inside of baking dish, line sides with portion of mashed potatoes, place meat and cooked onions in centre, season with pepper and salt, cover over with rest of mashed potatoes, and bake till the potato cover is brown. As potatoes absorb moisture from meat, about two pints of gravy prepared from the liquor in which the onions were cooked should be poured into the pie after it is taken out of the oven.

Hunter's Pie is prepared in a similar manner to the potato pie, but the top is left uncovered. Both these pies should be baked in a quick oven.—*Daily News*, *Nov.* 14, 1878.

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PRINCIPAL RULES

OF THE

GOVERNMENT INSURANCE AND ANNUITY OFFICE,

AND OF THE

POST OFFICE SAVINGS BANK.

PRINCIPAL RULES OF THE GOVERNMENT INSURANCE AND ANNUITY OFFICE.

Inquiries on this subject should be addressed to—
The Secretary,
General Post Office.

RULE—

1. The Postmaster-General is empowered, under the Act 27 & 28 Victoriæ, cap. 43, to insure the lives of persons of either sex, between the ages of 16 and 60, for not less than 20*l*. or more than 100*l*. He is also empowered under the same Act to grant Immediate or Deferred Annuities of not more than 50*l*. on the lives of persons of either sex, and of the age of 10 years and upwards. The persons whose lives are insured, or to whom Annuities are granted, by the Postmaster-General, have direct Government security for the payment of the money at the proper time.

2. Certain Post Offices (the names of which may be obtained at any Post Office) have been opened for the receipt of proposals for the Insurance of Lives and the purchase of Annuities, and forms of proposal, with full instructions for filling up and delivering these forms, may be obtained at these Post Offices.

3. Tables of the premiums to be charged for the Insurance of Lives; for the grant of Immediate Annuities; for the grant of Deferred Annuities or Deferred Monthly Allowances, without return of purchase money, and for the grant of Deferred Annuities or Deferred Monthly Allowances, with return of purchase money, have been printed, and may be seen at the Post Offices which have been opened for the receipt of proposals. These Tables may also be obtained of Messrs. Eyre and Spottiswoode, London. The price of the Tables for the Insurance of Lives and the grant of Annuities without return of purchase money is 3½*d*. The price of the Tables for the grant of Annuities with return of purchase money is 2*d*. If sent by post, 5*d*. is charged in the one case, and 3*d*. in the other.

Q 3840. 6100.—12/80. Wt. P. 1387. E. & S.

4. The Premiums to be charged for the Insurance of Lives vary wi the ages of the persons whose lives are to be insured, and with the mode i which they are to be paid.

The life of a Man or Woman in his or her 30th year may be insure for 100*l*.—

	£	*s.*	*d.*
By a single payment of - - - - -	43	3	7
or,			
By an annual payment, throughout life, of - -	2	6	7
By a quarterly payment, throughout life, of - -	0	13	0
or,			
By a monthly payment, throughout life, of - -	0	4	4
or,			
By a fortnightly payment, throughout life, of -	0	2	2
or,			
By an annual payment, until the insured person reaches the age of 60, of - - - - -	2	13	10
or,			
By a quarterly payment, until the insured person reaches the age of 60, of - - - -	0	15	0
or,			
By a monthly payment, until the insured person reaches the age of 60, of - - - -	0	5	0
or,			
By a fortnightly payment of - - - -	0	2	6

Smaller sums may be insured by proportionate payments, but no on of the periodical payments must be of less amount than two shillings.

At 30 years of age (next birth-day), 2*s*. per month will secure 46*l*. 1*s*. 10*d* at death.

5. No one life can be insured for less than 20*l*. in the whole; but whe a life has been insured for 20*l*., further insurances may be effected on th same life from time to time, for any amount, until the whole sum fo which it is insured amounts to 100*l*.

6. If, after having duly made his payments for a period of five years the insured person shall be unable to continue, or shall desire to dis continue, such payments, a portion of the premiums paid by him, whic portion will in no case be less than one-third of the whole sum paid b him, will be returned to him.

7. The sums to be charged for the purchase of Immediate Annuitie will vary with the age and sex of the person on whose life the Annuit is to depend:—

	£	*s.*	*d.*
A Man aged 65 can purchase an Immediate Annuity of 10*l*., payable half-yearly, for - - -	88	18	4
A Woman of the same age can purchase a like Annuity for - - - - -	103	16	8
A Man aged 70 can purchase an Immediate Annuity of 10*l*., payable half-yearly, for - - -	73	3	4
A Woman of the same age can purchase a like Annuity for - - - - -	84	19	2

8. The sums to be charged for the purchase of Deferred Annuities, or Deferred Monthly Allowances, will vary with the age and sex of the person on whose life the Annuity or Monthly Allowance is to depend; and with the length of the term for which the Annuity is deferred (or, in other words, with the number of years which are to pass before the commencement of the Annuity), and with the conditions of the contract as to the mode of purchase, mode of payment, and return or non-return of purchase money.

When the condition of the contract is to be that no part of the purchase money shall, in any event, be returned—

	£	s.	d.
A Man aged 30 may purchase a Deferred Annuity of 10*l.*, to commence on his reaching the age of 60, and to be payable half-yearly, either by an immediate payment of - - - - -	24	3	4
or,			
By an annual payment, until he reaches the age of 60, of	1	8	4
A Woman of like age may purchase a like Annuity by an immediate payment of - - -	32	8	4
or,			
An annual payment, up to 60, of - - -	1	17	6

and a Man aged 30 may purchase a Deferred Allowance of 2*l.* 7*s.* 3*d.* per month, to commence when he reaches the age of 60, by a payment until he reaches that age of 8*s.* per month; and a woman of like age may, by a like payment of 8*s.* per month, purchase a Deferred Allowance of 1*l.* 16*s.* 7*d.*, to commence when she reaches the age of 60.

When the condition of the contract is to be that, in the event of the death of the person on whose life the Annuity or Allowance is to depend before the commencement of the Annuity or Allowance, the purchase money is to be returned to his representatives, and that if the purchaser at any time before the commencement of the Annuity or Allowance is unable to continue, or wishes to discontinue, the purchase, the purchase money shall be returned to him; the price charged will be higher than when no such condition is made.

	£	s.	d.
Under this condition, a Man aged 30 may purchase a Deferred Annuity of 10*l.*, to commence when he attains to 60 years of age, and to be payable half-yearly, either by an immediate payment of -	40	9	2
or,			
By an annual payment, until he attains to 60 years, of	2	0	10
And a Woman of like age may purchase a like Annuity, either by an immediate payment of -	47	0	10
or,			
By an annual payment of - - - -	2	7	6

and a Man aged 30 may purchase an Allowance of 1*l.* 14*s.* 2*d.* per month, to commence when he attains the age of 60 years, by a monthly payment of 8*s.*; and a Woman of like age, by a like payment, until she reaches the age of 60 years, may purchase an allowance of 1*l.* 9*s.* 4*d.* per month.

9. The Annuity or Monthly Allowance granted on any one life must not exceed 50*l.* per annum, or 4*l.* 3*s.* 4*d.* per month; but purchasers need not purchase the whole amount of such Annuity or Allowance at one time. They may begin by purchasing such part as they can afford to purchase, and go on increasing their purchases from time to time as their circumstances will permit.

10. Husband and Wife may each be insured to the full amount of 100*l.*, and may each purchase an Annuity of 50*l.*, or a Monthly Allowance of 4*l.* 3*s.* 4*d.* Any two persons may purchase an Annuity on their joint lives, with or without continuance of the Annuity to the survivor.

11. Persons contracting for the Insurance of their Lives, or for the purchase of Annuities or Monthly Allowances, will be allowed to pay their periodical premiums or instalments of purchase money at such of the Post Offices, which have been or may hereafter be opened for the purpose, as will suit them best.

12. Persons proposing to effect Insurances on their Lives, or to purchase Deferred Monthly Allowances, must provide at their own cost such certificates of birth or baptism, or other evidence of age, as shall be required from them, but will not be required to pay any fee for medical examination, or to pay the cost of any inquiry which the Postmaster-General may think fit to make with regard to their health, habits, age, and occupation, or to pay any fee for the issue of any contracts which may be made in accordance with their proposals, or to pay any postage for the transmission of their proposals, or for the transmission of any correspondence arising out of such proposals between them and the Postmaster-General, inasmuch as a provision for all such costs and charges is included in the premiums which they will be required to pay, in accordance with the Tables framed for the purpose, for the Insurance of their Lives, or the purchase of Deferred Monthly Allowances.

Persons proposing to purchase Immediate or Deferred Annuities, payable half-yearly, must provide at their own cost such certificates of birth or baptism, or other evidence of age as shall be required of them; and, inasmuch as the premiums fixed by the Tables framed for the grant of such Annuities do not include any provision for costs and charges, must pay, at the time of purchase, a fee of 1*s.* for every 1*l.* of Annuity purchased.

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PRINCIPAL RULES OF THE POST OFFICE SAVINGS BANK.

A. Post Office Savings Banks are established at all Money Order Offices in the United Kingdom, and are open for the receipt and payment of money daily during the hours appointed for Money Order business.

At these Banks Deposits of One Shilling, or any number of Shillings, will be received; but no one may deposit more than 30*l.* in one year, or make a further deposit when the total amount standing to his credit has reached 150*l.* exclusive of interest.

Interest at the rate of 2*l.* 10*s.* per cent. per annum (which is at the rate of Sixpence in the Pound for each year, or at the rate of One Halfpenny on each complete Pound for each month, reckoning from the first day of the Calendar month next following the day on which a complete Pound has been deposited, or on which deposits of a less amount have made up a complete Pound, up to the last day of the Calendar month preceding the day on which the money is withdrawn) is allowed until the sum due to a Depositor amounts to 200*l.*, when interest ceases to be allowed. The interest due to each Depositor is added to the principal due to him on the 31st December in each year.

B. Every deposit in a Post Office Savings Bank, should, at the time, be entered by the Postmaster, or other person receiving it, in the Depositor's Book, and the Postmaster or other person receiving the deposit should affix his signature and the stamp of his office to each entry. Depositors should carefully examine their books before leaving the offices, and ascertain that the entries therein are correct, and they should keep their books in their own possession.

In addition to the receipts which the Depositors will thus obtain in their deposit books, they will receive for each deposit an acknowledgment by post from the Savings Bank Department in London. This acknowledgment should reach the Depositor within four days from the day on which he makes his deposit, if the deposit be made in England or Wales. If the deposit be made in Ireland or Scotland, the acknowledgment should reach the Depositor within six days. The acknowledgment should be quite free from erasure, and should state the exact amount of the deposit, and the day on which the deposit was made. If the acknowledgment does not reach the Depositor in proper time, or if, when it reaches him, it shows any signs of erasure, or does not agree with the entry in his book, the Depositor should immediately apply to the Controller of the Savings Bank Department by letter, and should renew his application again and again, until he obtains a satisfactory reply.

C. Once in each year, on the anniversary of the day on which the first deposit was made, the Depositor should forward his deposit book to the Controller of the Post Office Savings Bank Department in London, in order that it may be compared with the books of that Department, and in order that the interest due to the previous 31st December may be inserted in it.

D. When a Depositor wishes to withdraw the whole or any part of the sum due to him, he must make application for the same on a printed form called a Notice of Withdrawal, which he can obtain at any Post Office Savings Bank. When he has properly filled up this form, he must fold and secure it, and forward it by post as if it were an ordinary letter. In return for it he will receive a warrant for the amount required by him, payable at the Post Office Bank named by him in the Notice of Withdrawal.

E. A Depositor in any Post Office Savings Bank may add to his deposits at that or any other Post Office Savings Bank, and may withdraw the whole or any part of them from that or any other Post Office Savings Bank, without change of deposit book. For instance, if he makes his first deposit at the Post Office Bank at Huddersfield, he may make further deposits at, or withdraw his money from, the Post Office Bank at Huddersfield, or Leeds, Manchester, Birmingham, Edinburgh, Dublin, or any other place which may be convenient to him.

F. No charge will be made to Depositors for the books first supplied to them, or for the renewal of those books; but if any Depositor shall lose his book, and shall desire a new book, he must make application to the Controller of the Savings Bank Department for the same, and must enclose in his application Postage Stamps to the value of 1s. to pay for the new book. If a Depositor loses his book, he should immediately give notice of the loss to the Controller of the Savings Bank Department.

G. No charge for Postage will be made on the Depositor for any letter passing between him and the Savings Bank Department with regard to his deposits, or with regard to the withdrawal of the same, or for the transmission of his deposit book between him and the Savings Bank Department.

H. The Postmasters and other Officers of the Postmaster-General employed in the receipt or payment of deposits, are strictly forbidden to disclose the name of any Depositor, or the amount of his deposits, except to the Postmaster-General, or to such of his Officers as are appointed to assist in carrying on the business of the Post Office Banks.

I. A full statement of the Regulations of the Post Office Banks may be seen in the "Post Office Guide," and at any Post Office Bank; where also information may be obtained with regard to the Rules affecting—

(A.) The deposits made by Trustees on behalf of another person.

(B.) The deposits of Minors.

(C.) The deposits of Married Women.

(D.) The deposits of Friendly or Charitable or Provident Societies or Penny Banks.

(E.) The repayment of the deposits of deceased Depositors to their representatives.

(F.) The repayment of the deposits of Depositors who have become insane, or who are, from other causes, unable to act for themselves.

Notice relating to Investments in Government Stock under the Savings Banks Act, 1880,

Depositors in the Post Office Savings Bank may, through the agency of the Post Office, invest their deposits in "Consolidated," "Reduced," or "New" Three per cent. Government Stock.

Any depositor who may desire to so invest must forward to the Controller, Savings Bank Department, General Post Office, London, an application on a printed form to be obtained at any Post Office Savings Bank. The investment will be at the current price of the day on which it is made, and a certificate thereof will be sent to the Depositor by post.

Sales of Stock so invested will be effected at the request of the Depositor, made in like manner; and in such case the value of the Stock at the current price of the day of Sale, less the commission, will be forthwith paid by Warrant to the Depositor at the Post Office Savings Bank most convenient to him.

Dividends upon Stock standing in a Depositor's name will be credited to his Deposit Account as they become due; and will be entered in his Deposit Book when it is received for the annual examination.

The sum invested must not in any case be less than 10*l.*, or the amount of the current price of 10*l.* stock with the Commission; and no sale must be of less amount than 10*l.* Stock, or Stock of the value of 10*l.* over and above the Commission. The amount of Stock credited to any one account in any year ending the 31st December must not exceed 100*l.* Stock, and the total amount credited to one account must not exceed 300*l.* Stock.

For the purpose of immediate investment in Stock, deposits may be made in the Post Office Savings Bank to an amount not exceeding the value of 100*l.* Stock in any year ending the 31st of December, irrespective of the amount allowed to be deposited under the Post Office Savings Banks Act; but an application to invest must be forwarded at the time of deposit.

The Commission payable upon Investments or Sales will be as follows:—

For an Investment.
(Including Receipt of Dividends.)

On Stock not exceeding 25*l.* -	**9d.**
Exceeding—	
25*l.* but not exceeding 50*l.*	**1s. 3d.**
50*l.* ,, ,, 75*l.*	**1s. 9d.**
75*l.* ,, ,, 100*l.*	**2s. 3d.**

For Sale of Stock.

Not exceeding 25*l.* - - - -	**9d.**
Exceeding—	
25*l.* but not exceeding 50*l.*	**1s. 3d.**
50*l.* ,, ,, 75*l.*	**1s. 9d.**
75*l.* ,, ,, 100*l.*	**2s. 3d.**
100*l.* ,, ,, 200*l.*	**2s. 9d.**
200*l.* ,, ,, 300*l.*	**3s. 3d.**

Stock Certificates.

Any Depositor having sufficient Stock standing to his credit in the Government Stock Register of the Post Office Savings Bank may obtain a Stock Certificate, or Stock Certificates, with coupons for Dividends annexed, payable to bearer, pursuant to the National Debt Act, 1870, upon making application to the Savings Bank Department on a form provided for the purpose, a copy of which can be obtained at any Post Office Savings Bank. These Certificates are obtainable for 50*l.*, 100*l.*, or 200*l.* Stock. The Commission chargeable upon such Stock Certificates will be the same as for the Sale of Stock in addition to the Fee of Two Shillings per cent. payable to the Bank of England.

The Depositor's Book must in every case be sent with an application for Investment or Sale of Stock, or for a Stock Certificate. A cover for the purpose may be obtained at any Post Office Savings Bank.

Any further information may be obtained on application to the Controller, Savings Bank Department, General Post Office, London, E.C.

SMALL SAVINGS BY POSTAGE STAMPS.

Any person desirous of saving One Shilling, by means of penny contributions, for deposit in the Post Office Savings Bank, may do so by purchasing with every penny so saved a penny Postage Stamp and affixing it to a form, a copy of which can be obtained at any Post Office in the United Kingdom. When 12 such stamps have been so affixed, the form may then be taken to any Post Office Savings Bank, where it will be received by the Postmaster, and One Shilling be allowed for the Stamps, which Shilling will be accepted either as the first deposit in a new account then to be opened, or as an ordinary deposit if the owner of it has already opened an account.

If the Stamps affixed to the form are defaced or in any way damaged, they will not be received by a Postmaster.

Copy of Form.

POSTAGE STAMPS FOR A DEPOSIT OF ONE SHILLING IN THE POST OFFICE SAVINGS BANK.

12 Penny Stamps to be affixed below.

						Depositor's Book. Office of Issue ________ No. of Book ________	
						Dated Stamp of Post Office receiving the Postage Stamps.	

5–

RECORD OF TREATMENT, EXTRACTION, REPAIR, etc.

Pressmark:

Binding Ref No: 0045

Microfilm No:

Date 27.10.95	Particulars
	Chemical Treatment
	Fumigation
	Deacidification ✓
	Lamination ✓
	Solvents
	Leather Treatment
	Adhesives P.V.A. M218 WHEAT STARCH PASTE
	Remarks

[illegible]

STANDARD READING BOOKS

[illegible]

[illegible]

[illegible]

[illegible]

STANDARD I.—[illegible]

[illegible]

STANDARD II.—[illegible]

[illegible]

STANDARD III.—[illegible]
[illegible]

[illegible]

STANDARD IV.—Original Stories and [illegible]
Poems

[illegible]

STANDARD V.—[illegible]
[illegible]

[illegible]

STANDARD VI.—[illegible]

[illegible]

[illegible]